April 1969

Railway Signaling & Communications

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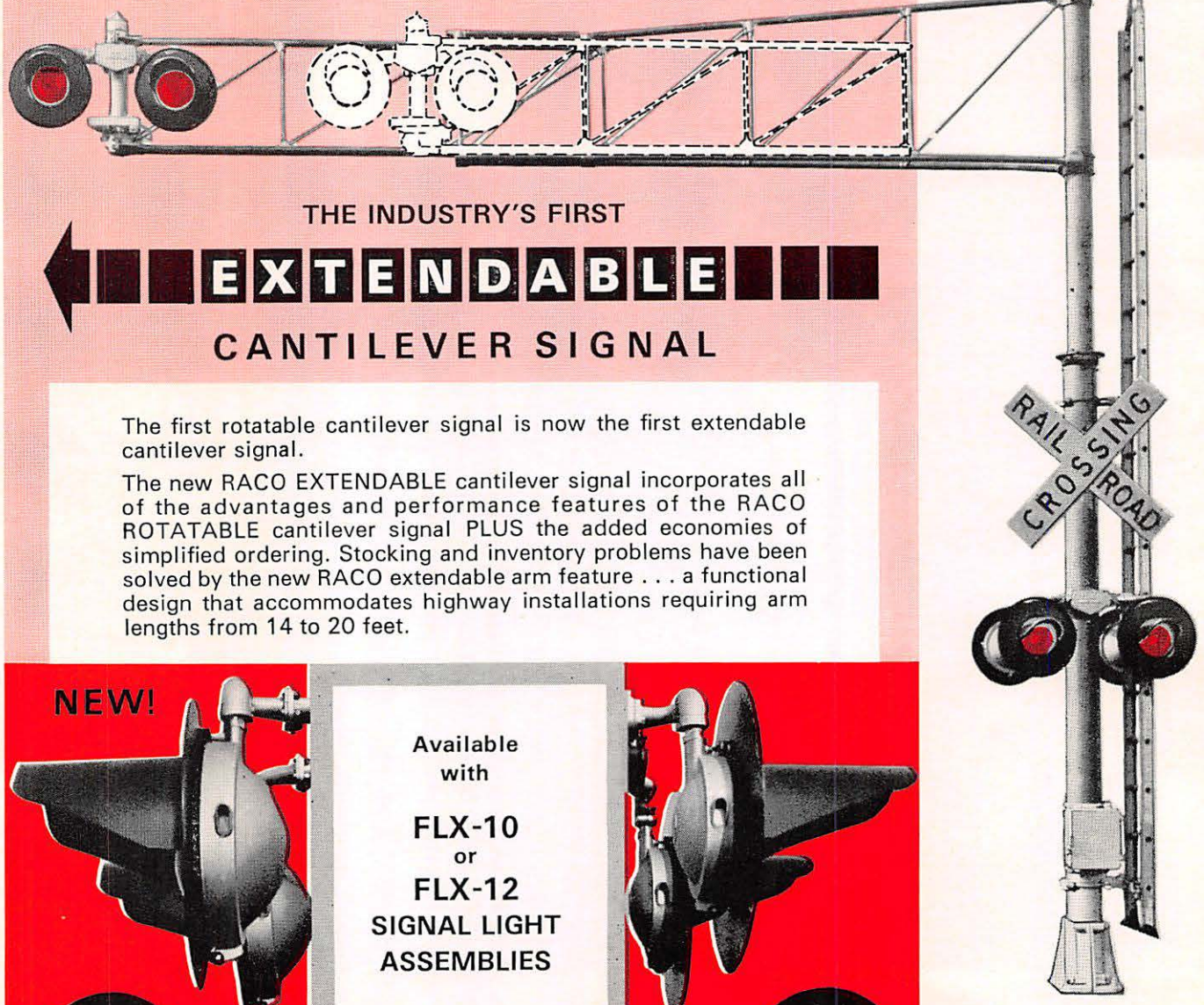

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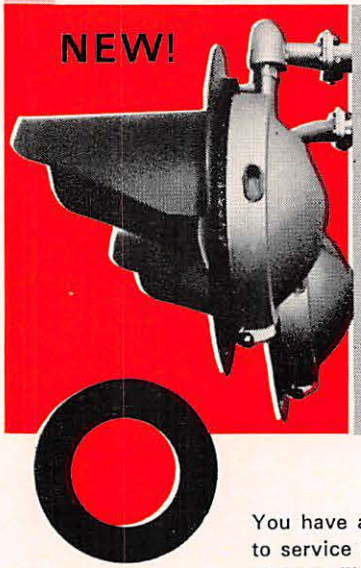

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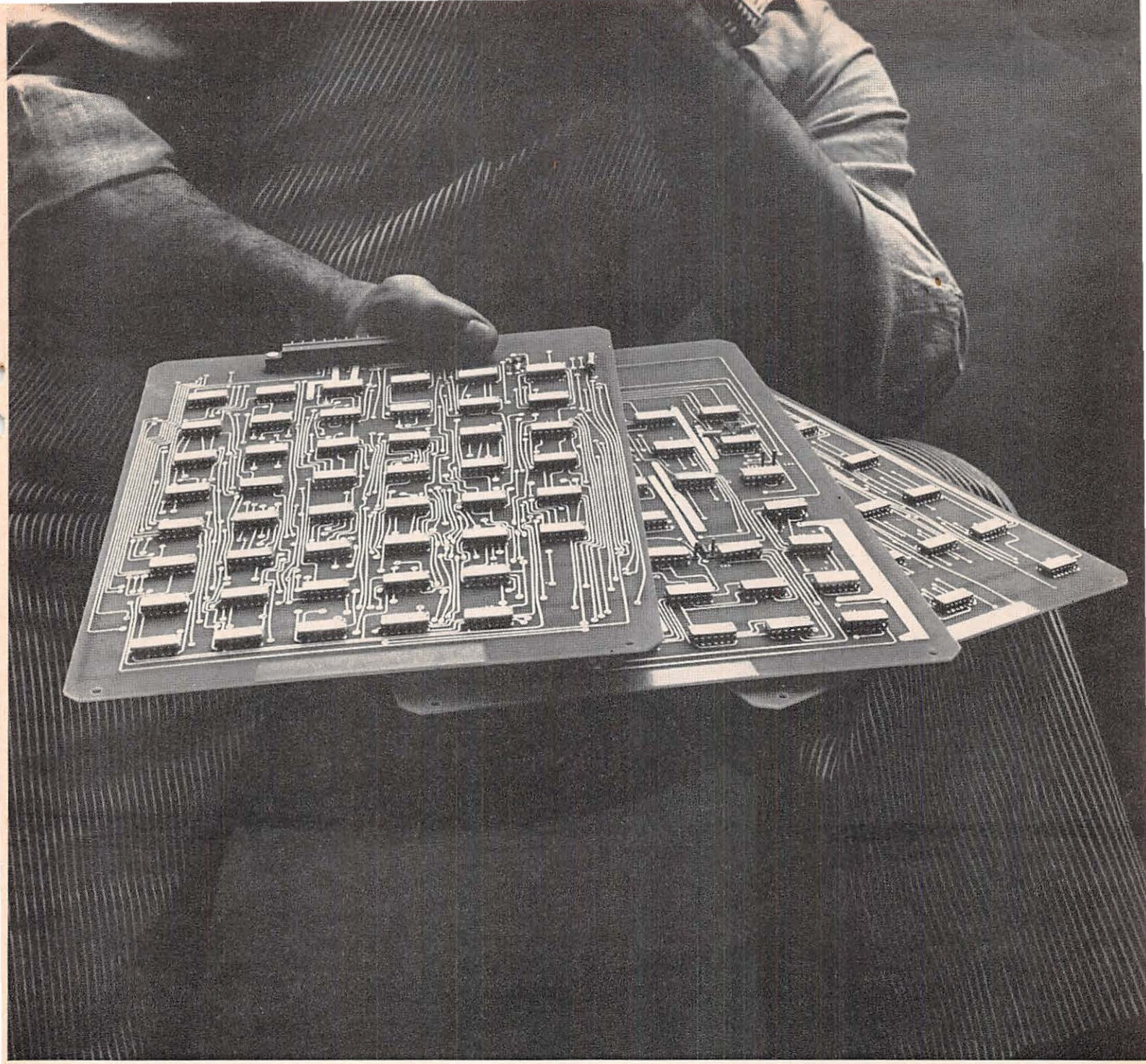

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Editor's Corner

Crossing Safety

America's traditional respect for human life was evident at February's National Conference on Rail-Highway Grade Crossing Safety held at the University of Illinois. For 2½ days, over 300 conferees analyzed, discussed and sought solutions to this vexing problem that takes about 1550 lives annually. Deaths due to crossing accidents, however, are but 2-3% of the total killed on the nation's highways. A major accomplishment, noted many who were there, was that of establishing rapport and meaningful working relationships among the various interested and concerned groups.

Railroad men, particularly from signal, engineering and safety departments were well represented at the conference. An equally large group was from state highway departments. But equally out in force were representatives of federal, state and local governments, including various safety boards and regulatory commissions. Traffic research consultants and university professors were active participants as well.

Several speakers emphasized that lack of standards or uniformity make effective solutions difficult. For example, there is a need for uniformity in accident reporting, roadway geometrics, law enforcement, signing, driver education and licensing. There is little uniformity among states, and sometimes little standardization within a state. This lack of standardization makes it most difficult to find solutions that are not customized to the point of being too expensive, not only in time and effort, but in cost.

Education of the public to the need for greater safety was cited by many speakers at the conference. Many motorists are more interested in saving time than in saving their own lives. Unfortunately, this also applies to school bus and tank truck drivers. A "near-miss" program is in effect on most railroads. Train crews report school buses or tank trucks that pass over crossings in front of trains so close that the engineer must make an emergency brake application. On some roads, the engineer reports via two-way radio to the dispatcher who notifies law enforcement officers. A police officer will call on or a letter will be sent to the driver involved in the near-miss.

Other programs used by railroads to inform motorists about grade crossing safety include movies, slides, publications and personal appearances by rail safety officers at schools, clubs, and driver education classes. One railroad finds it most useful to have police and judges ride locomotive cabs to view the crossing situation from the engineer's vantage point.

Bob McKnight

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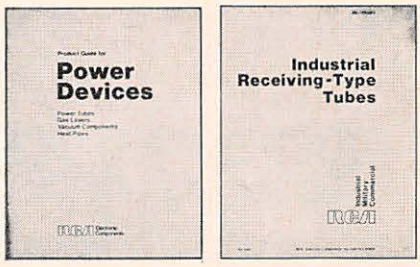

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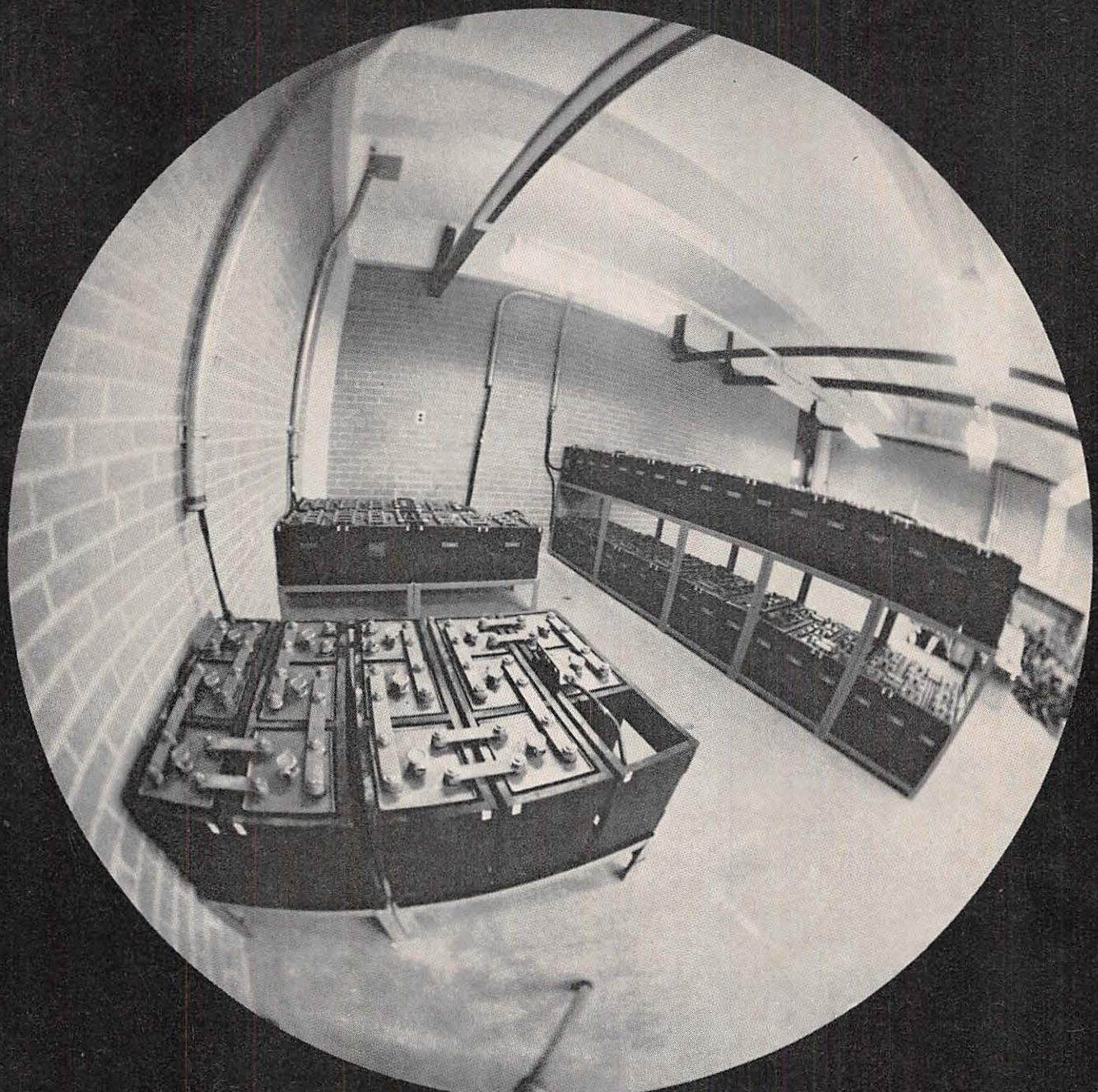

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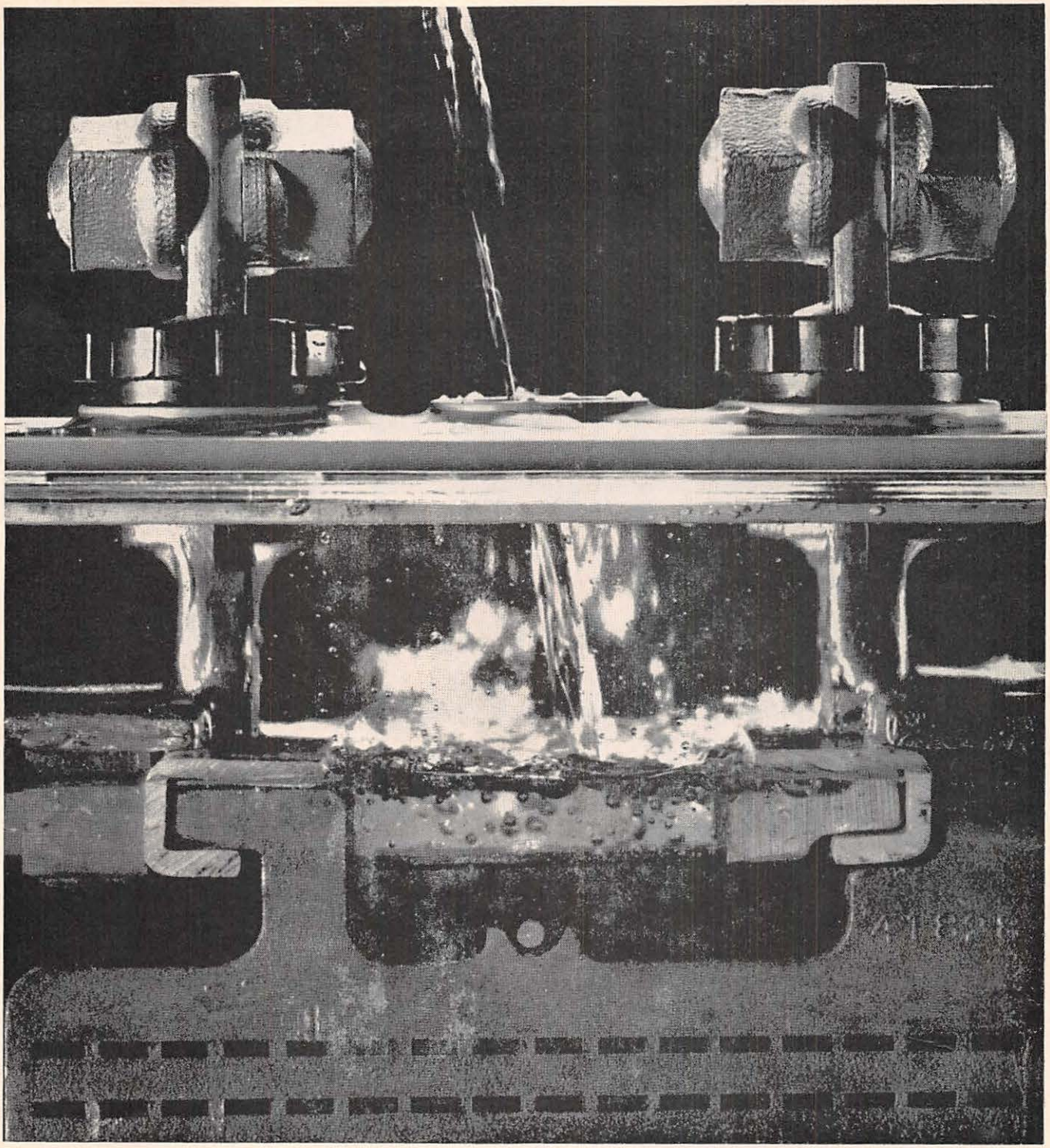

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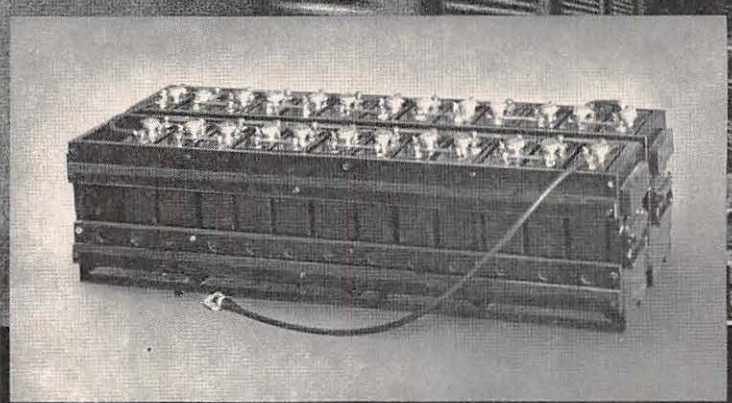
The battery and ½



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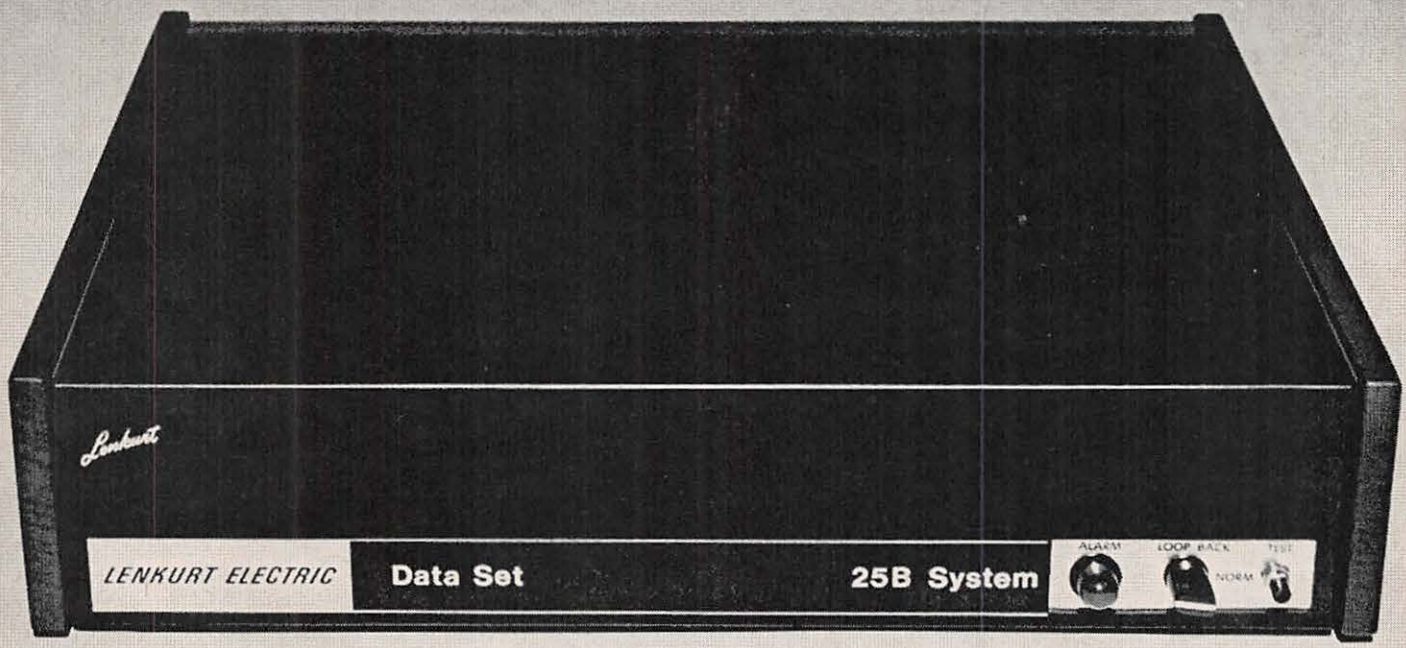

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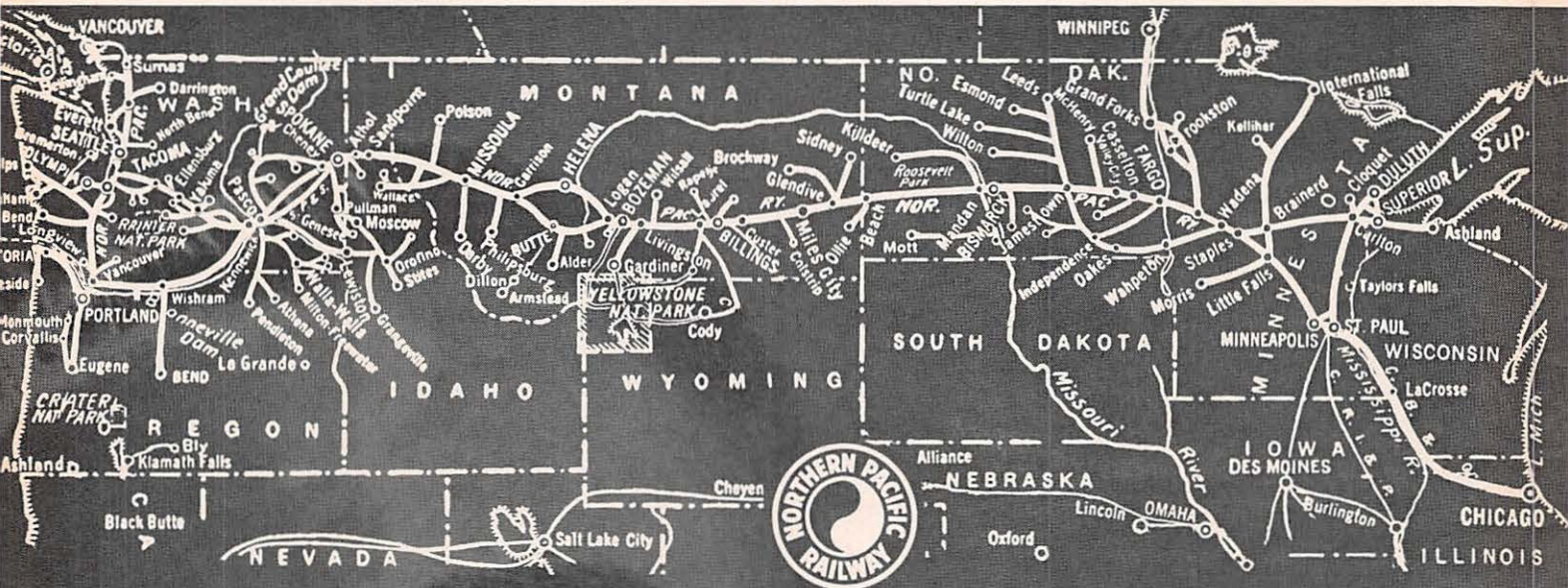

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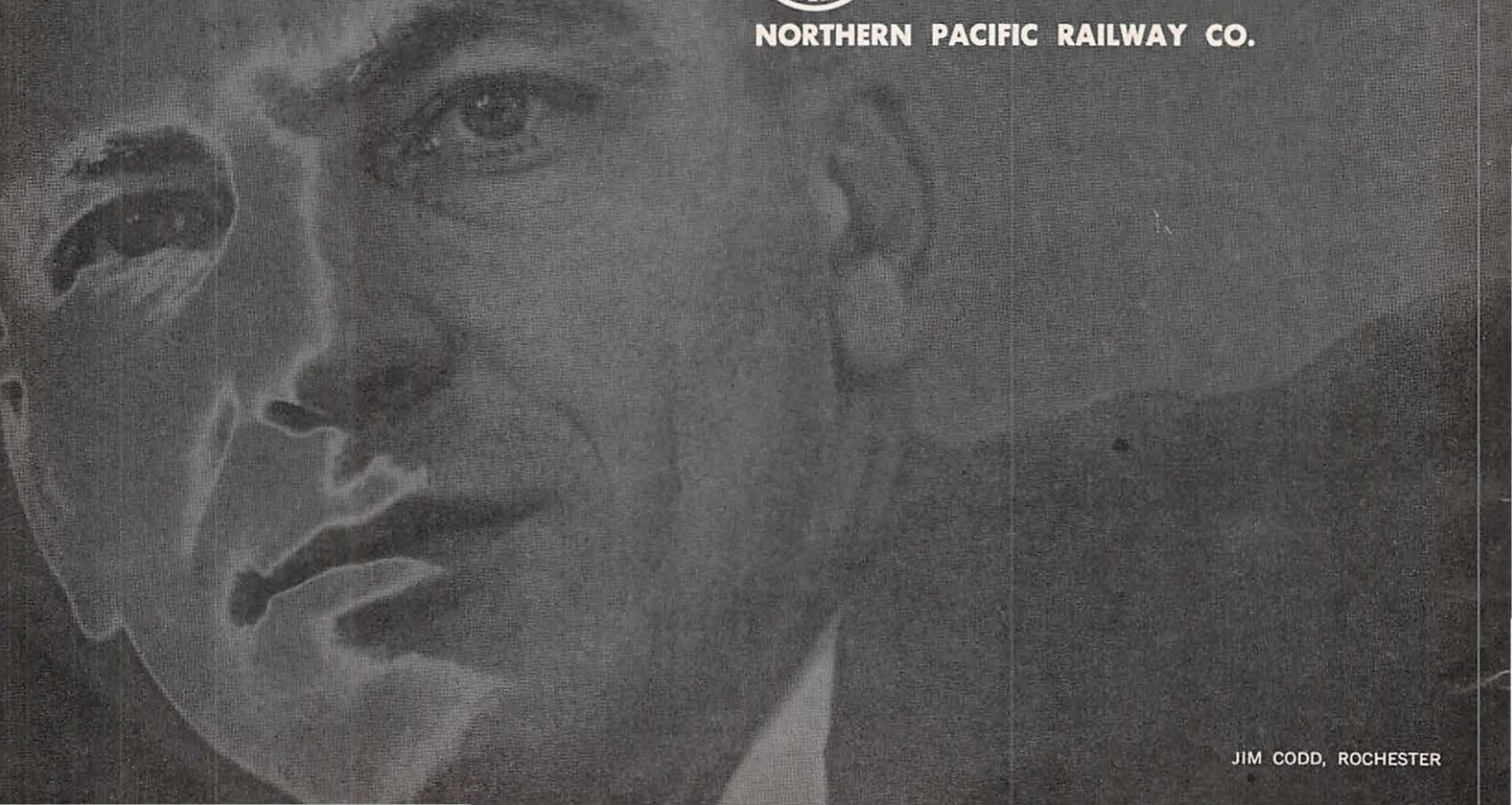

JIM CODD, ROCHESTER

Railway
Signaling &
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RAILWAY CYBERNETICS:

Computer usage hits S&C areas

Long used for accounting purposes, the business digital computer is slowly finding a home in the signal and communications area of activity. The process control version is finding almost universal acceptance these days for automatic control of retarders and for routing of freight cars in classification yards. On the communications side, the digital computer is being widely used as a message switching device.

But to find out what other uses are being made of computers in the signaling and communications areas. *Railway Signaling & Communications* surveyed major Class I railroads. Some of the more frequently mentioned uses are listed at the right, while a tabulation of replies to questions concerning some specific uses are outlined later in the article.

Several roads mentioned projects requiring computer usage other than those shown in the table. For example, Frisco listed four: (1) message switching of administrative and data traffic; (2) circuit fault reporting on the data network; (3) tracing caboose equipment to dispatch communications forces to repair radio equipment; and (4) responsibility cost statements. Great Northern reported that it is in the process of handling radio repair records on a computer. Similarly, Illinois Central's communications department is maintaining a permanent inventory of location of all radio equipment on computerized records. IC also has a message switching system in operation.

Louisville & Nashville lists six computer projects in addition to R&D into audio frequency track circuit selection and communications traffic studies. They include: (1) computer program to determine microwave path, distance and azimuth; (2) microwave survey computer program to determine total path loss, total signal gains, net path loss, median received signal, C/N carrier to noise ratio and fade margin; (3) computer program to determine location of 150 kHz transposition points on open line wires; (4) program on ra-

Signal and communications men are using computers for:

- Signal spacing studies
- Siding spacing studies in CTC
- Classification yard design
- Communications traffic studies
- Assigning radio frequencies
- Locating hotbox detectors
- Message and data switching
- Maintaining radio repair records
- Determining microwave paths
- Locating pole line transpositions
- Monthly budgeting, cost accounting
- Simulating CTC dispatching
- Critical path method updating

dio maintenance; (5) critical path method updating; (6) monthly budget spending, accounting for operating expense and A&B projects. Soo Line also uses a computer for determining pole line transposition layouts.

How is liaison between the signaling and communications department handled?

Most roads reporting in the survey indicated that coordination is handled by the two department heads often via correspondence, meetings and informal work groups. Almost general agreement was reported that the communications department works very closely with data processing. A few railroads have committees composed of the various department heads that handle such interdepartmental projects.

Does the signaling and communications man work with data processing department? Or is it on a project basis with the signaling and communications man handling the project work with the data processing department?

Work is handled on a project basis, reported most roads. A few roads bring in systems analysts to help the S&C men in the project. Penn Central has a senior systems analyst in the communications and signal department.

If other than signaling and communications departments apply computer usage to signaling and communications projects, the following five questions were asked as pertaining to four major departments: industrial or systems engineering, data processing, engineering or operating. (a) Who initiates signaling and communications project studies? (b) Who does the data processing programming? (c) Is there liaison with signaling and communications departments? (d) Is there coordination with signaling and communications departments? (e) Who receives copies of results of the study?

In general most replies are in agreement that there is coordination and liaison with signal and communications departments. Also, in most instances, programming is performed by men in the management services or data processing departments. Also, copies of reports are sent to all concerned. On C&O/B&O, signaling and communications projects may be initiated by the planning staff as well as the chief engineer, superintendent of signals, superintendent of communications, On the D&RGW, such projects may also be initiated by transportation research men, as well as various department heads including engineering and operating.

C&S project studies are a joint effort on the L&N. Usually the studies are initiated by the C&S department, however, such a request may come from the chief engineer, chief transportation officer, or the general manager. Programming is usually performed by the engineering methods and procedures people and the management information services department. At all times there is close liaison and coordination with C&S people. Reports are sent to everyone concern-chief transportation officer and chief engineer, management information services officer and the chief C&S officer.

MILW, MP, PC, UP and WP generally follow practices similar to those followed by the L&N. It's a cooperative effort with everyone being consulted and kept informed about progress and receiving final reports. On Penn Central, signaling and communications project studies may be initiated by general managers, division superintendents, regional C&S engineers and industrial engineers or operations planning people. Data processing is done by the business systems department with coordination with C&S and others involved in the studies. On the UP, the data processing research committee may be involved as well as the director of COIN, superintendent of communications and the vice-president operations.

For applications of data processing for various studies or projects, does your railroad have a committee or or group whose function is to determine what projects shall be undertaken? Who are members of this committee?

On the Burlington, the management information service department handles this function. C&O/B&O has a committee with representatives of planning, operating, engineering, mechanical and traffic departments. Computer projects

Computer usage enters S&C areas

What use are signaling and communications making of computers:

a. Payroll	Yes (19)	No (2)
b. Materials management	Yes (15)	No (5)
c. Research and Development	Yes (3)	No (18)
d. Studies of signal spacing	Yes (4)	No (17)
e. Studies of siding spacing in CTC territory	Yes (5)	No (16)
f. Retarder classification yard design	Yes (7)	No (14)
g. Communications traffic studies	Yes (11)	No (10)
h. VHF radio frequency assignments	Yes (1)	No (20)
i. Mathematical analysis for location of hot box detectors	Yes (2) Yes (5)	No (19) No (16)
j. Other projects		

Does the signaling and communications department have a computer programmer for these projects? Yes (3) No (18)

If not, is there a programmer in the data processing department that works on signaling and communications projects? Yes (9) No (12)

committee is the name of the group on the Frisco that determines what projects involving data processing applications are worthy of attention. Members are assigned management people from all line departments.

The communications and computer services department of the IC has an advisory committee made up of representatives from other major departments which meets periodically. This activity is supplemented by a newsletter circulated to members of the committee and other railroad officers. On the L&N, this special projects committee is composed of representatives from the transportation, management information services, operating & engineering departments. On the MILW, the chairman of this study project committee is the director of management services and other members include assistant general manager, assistant chief mechanical officer, superintendent transportation and assistant chief engineer, signals and comms.

A similar alignment is followed by MP with a management information system group consisting of transportation, systems, traffic, accounting and industrial engineering personnel. N&W has such projects handled by the research department, while on the NP there is a steering committee that handles these computer oriented projects. Members are the vice-president operations, vice-president management services, vice-president law department, general superintendent transportation, general manager. On occasions, the superintendent communications represents the vice-president operations. PC employs a committee made up of members from business systems, industrial engineering, operations planning and communications and signal departments.

Rock Island approaches the problem of deciding which projects of computer applications are worthy of further study with an interdepartmental data processing committee. Membership includes senior vice-president (chairman), manager operations control and statistics, director of purchases and stores, director of labor relations, director of personnel, general superintendent communications and signals, director of data systems, assistant manager pricing and the comptroller. On the UP, the steering committee is composed of all department heads and the president.

If there is no steering committee or projects committee to determine what projects are worthy of study via data processing applications. do individual department heads, such as signaling and communications, initiate these studies? Who do they work with and how is the work progressed?

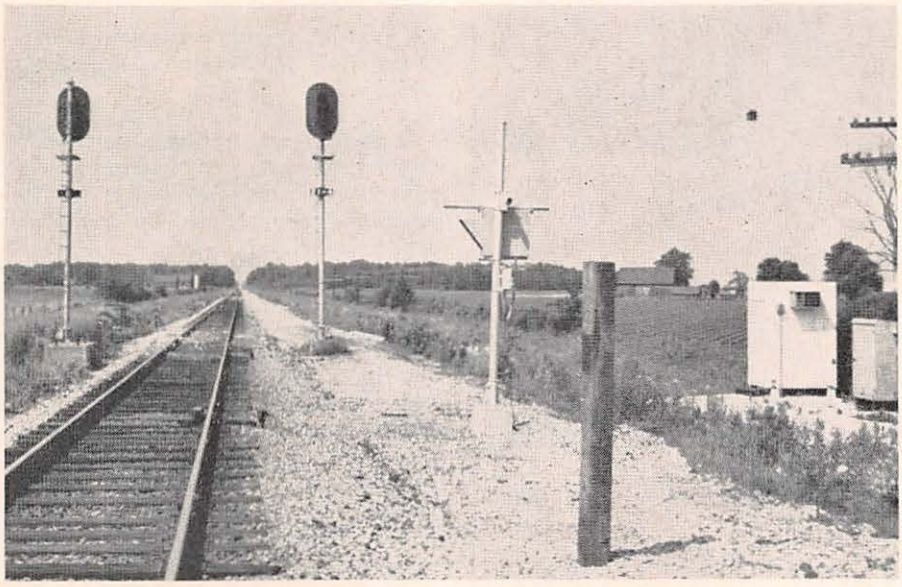
Projects are initiated individually by users or systems people or top management on the C&NW. Priority is assigned by top management. If the study proves to be necessary on the D&RGW, appropriate personnel are assigned to make the study. Implementation is then concluded with a study team including liaison with a systems analyst/programmer.

On the GN, the request is made by the vice-president operations and chief engineer and progressed through the signal & communications department. Individual department heads on the MILW will occasionally initiate action for data processing applications. Work is handled through the normal channels via vice-presidents. A proposed study may be submitted by a department head on the RI to the interdepartmental committee, directly or through his representative on the committee. On the Santa Fe, studies are initiated by the communications or signal department's personnel, cleared with the head of the department and then coordinated with the information systems department to progress the project.

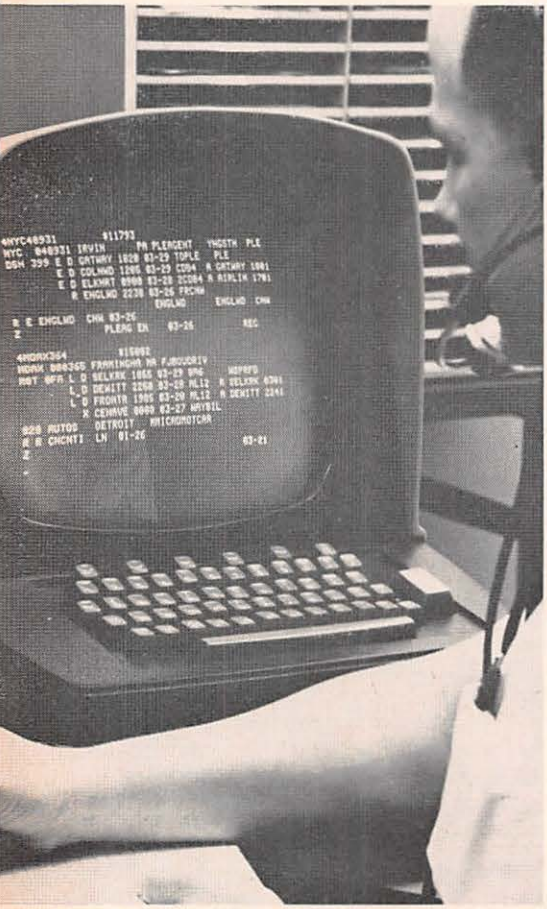
Seaboard Coast Line allows individual department heads to initiate S&C studies by assigning specific individuals to the project. On the SOO, studies are approved or assigned by the vice-president in charge of the department. On the SP, individual department heads can initiate studies, and they work with computer system engineers. Similarly, such projects are handled on the WP with the systems and information services department having the project responsibility. Close coordination is maintained with the user department.

What plans for the future do you have for using data processing in signaling and communications areas? For every day operations or for special studies?

ACI, information retrieval and CTC are three



Automatic car identification scanners at yard entrances, for example, will probably feed directly into computers for instant car location. Computers will or are being used to determine signal spacing in automatic block and centralized traffic control territories. Signal equipment reliability and maintenance will receive computer aids.



Instant data retrieval is but one of many computer uses now entering signaling and communications areas.

Siding spacings and train dispatching in CTC territories can now be determined by computer application.

Fourteen of the 21 railroads responding to the survey reported some future plans involving data processing for S&C usage. These went beyond conventional uses for payroll, materials management and message switching. C&O/B&O, for example, are planning for detector device reporting to a computer for everyday use. Frisco plans to go into computerized train dispatching and investment analysis of signal and communications projects. For everyday operations, Frisco is planning to record and summarize radio performance and frequency checks. Also, it is planning for computer usage to record and summarize failures of signal and communications systems.

GN and IC also expect to make use of data processing for analyzing communications equipment failures. For GN it will be failure of radio equipment, while IC will keep a real time inventory of all communication circuit outages and perform statistical studies to spot trends. L&N will use data processing to program for microwave maintenance. Also included will be fault and path performance analysis on microwave systems.

MILW hopes to develop ability to use a time shared computer for planning and operating problems. For special studies, MILW is looking into regression and correlation analyses. Other possible studies include signal spacing and signal failure rate analysis. A main problem or bar to computer use at present is lack of personnel skilled in computer techniques and/or programming.

For future CTC system designs, MP plans to use computer techniques involving the single track capacity analyzer. Also in the signal area, NP is planning to use data processing for improvement project status determination. For everyday operations, NP signal engineers find computer usage invaluable for performance forcasting, critical path diagrams, production control and project evaluation and review techniques. One special study mentioned in the survey response is time-distance studies of free rolling cars in hump yards.

PC plans to use computers for further yard and traffic control projects and for design of traffic control layouts. RI, while now concentrating on message switching and car status reporting, plans to establish a committee of communications and signal personnel to examine computer applications.

# of many C&S areas involving computer usage.

Santa Fe plans for possible handling of FCC records on a computer basis. SP, meanwhile, considers computer usage in the field of automatic car identification and central dispatching to be of advantage in every day operations.

Speaking of futures, several roads mentioned that they have done some work in dispatcher simulation on a computer or are planning such operations. Much pioneering work has been done—as for instance, in the use of the train performance calculator (TPC) and the single track capacity analyzer (STCA). TPC solves mathematical equations for movement of a train over a section of track, taking into account grades, curvature, speed restrictions, locomotive horsepower, braking characteristics, train resistance, fuel consumption, etc. STCA does its work with the movements of all trains on a given section of line—simulating a dispatcher's control of traffic in CTC territory, for example. Today's computer equipment can plot 20 trains over 150 miles of line in about 10 minutes. One railroad has been able to run simulations of an entire week's train operations in about 90 minutes of computer time.

Benefits of these techniques are wide-ranging—and specific. Take for instance, the case of the signal engineer studying proposed new installations in centralized traffic control territory. Cost of signaling a siding averages about $50,000. With simulation, the engineer can know—before final decisions and commitments are made—that the siding will be located so as to draw maximum benefits from the CTC system. He can know whether he should lengthen blocks or add signal aspects to provide proper braking distances for high-speed freight-train operations. Simulation print-out can give him vital data on train configuration and capability, on running time, delay time and meet or pass situations where one train must take the siding.

Then, take simulation and the signal department one step further—to computer control of CTC systems, as feedback from the CTC machine (train location, switch and signal position data) is added, to close the control loop. Benefits could be enormous, in terms of efficiency and return on investment.

Some roads are already making studies of the possibility of having computers take over routine CTC machine operation. In such cases, the dispatcher would take over when unusual conditions or emergencies arise.

With such computer usage and monitoring, exception reports could be automatically generated when trains are behind schedules. With computer simulation of CTC operations, the actual train performances would be checked against the simulation, possibly using the simulation as the standard for quality control of train operations.

Railroads are moving into centralized dispatching—locating all CTC machines and dispatchers at a headquarters—and it appears that most roads will have such centralized control in the not-too-distant future. With the installation of automatic car identification scanners, such train identification information could be fed directly to computers, providing further refinement of accuracy of train movement reporting.

COMPUTERS AND DETECTORS

Some roads reported studying the tying in of real-time computing with clearance and hotbox detectors. Data from clearance detectors, for example, would be telemetered to central locations and fed into computers which contain information on clearance restrictions. The computer would match the detector's reports against this filed information and issue instructions for routing the train around the restricted locations.

Several roads have or are making statistical studies of hotbox detection and hot box occurrences, and with the aid of the computer developed means to determine when hotboxes will develop. Information from hot box detectors can be telemetered into a computer, which would instantly analyze the data and compare it with reports from previous scans by detectors. Hotboxes could be flagged immediately, and journals just beginning to heatup could be flagged for attention at the proper time.

Although this survey was designed to find out what railroads are doing to make use of computers and data processing for signaling and communications projects, evidence points to the fact that much of the work of S&C departments are involved with computers. But this work is not solely designed for S&C application. There is no doubt that computer applications are and will be found useful for specific signaling and communications projects.

Of immediate concern with many signal and communicatirns departments is living with, supporting and working with computers in those areas of message switching, operations control and automatic classification yards. NP, for example, is now designing a second generation control system for its Pasco, Wash., retarder classification yard. A digital computer will be used for route selection and inventory of cars in the yard and terminal area. Louis W. Menk, NP president, says: "Interface with the central computer system at St. Paul will be accomplished by the use of IBM card devices, but some of our more optimistic planners foresee the day when direct communication between St. Paul and Pasco computers will enable transmission of advance consists without the card buffer.

"Terminal performance control will be processed at the central computer rather than at the yard because we have concluded that this is the more logical way to do it. Here, then, is a combination of new technology in yard control with an on-line, real-time information system, each increasing the other's capability."

On the other end of the scale, so to speak, is the total systems control, which SP has in service, known as TOPS (Total Operations Processing System). "The focal point of this system is two IBM 360 model 65 computers located in San Francisco. One computer is used for on-line data collection and processing, the other is maintained as standby for the on-line unit and used for off-line storage and processing of information passed to it from the on-line machine. Connected to the central computer are approximately 430 input/output units. The information transmitted or received via I/O stations will be handled over 198 data circuits," SP's general superintendent communications, system, John N. Albertson, reports.

"The line layout for the entire communications network was designed with a planned utilization factor of 40% which would insure message response time of approximately 15 minutes for 90% of all operational input messages," Albertson says.

Crossing safety improves

Second part of two-part series reports on Rail-Highway Grade Crossing Safety Conference held at the University of Illinois. Federal and state aid to railroads were outlined in first article (RS&C March 1969, page 20).

The ultimate solution to the rail-highway grade crossing problem is the elimination of these crossings by underpasses, overpasses, closing of crossings, i.e., closing of the street or road, or abandoning or diverting the railroad. Speakers at the National Conference on Rail-Highway Grade Crossing Safety set a $100 billion price tag on the job of providing grade separations for the nation's 225,000 rail-highway crossings.

That railroads, highway planners and engineers are doing much for highway-railroad grade crossing safety, there is no doubt. But the public must do more in this never-ending problem. "We need desperately to mount programs informing the public of the dangers at crossings—and then keep it up. Every year, thousands upon thousands of new drivers need to be inculcated with safe habits when driving over grade crossings," stated William B. Johnson, president, Illinois Central.

Realistic control of the problem can come about through application of standards, Johnson said.

- "We need uniform laws controlling vehicles through grade crossings.
- "We need uniform enforcement of such laws.
- "We need uniform standards for financing needed automatic protection, and we need uniform standards for maintaining such protection once installed.
- "We need uniform, better signs in advance of and at crossings.
- "We need some agreement as to what crossings can be eliminated. We also need some standards governing the creation of new crossings.
- "We must have a uniform, greatly expanded program of public education.
- "We have to provide a beginning for the uniform financing of grade crossing protection," Johnson said.

He said that up to 10% of federal funds available to a state for its federal aid highway system may be used for grade crossing improvements.

Priority was a word used by many speakers. With the limited funds to spend in this entire area of grade crossing safety—education of drivers, signing, roadway improvements, crossing protection equipment, and grade separations—there has to be a set of priorities as to which crossings to grade separate, where funds should first be spent on improved crossing protection equipment, etc. Cost benefit analysis of each crossing situation could produce priority information.

In the federal aid area for grade crossings, over 1,800 crossings have been eliminated in the five year period 1962-1967. Eliminations were due to

Payoffs for improved grade crossing conditions include greater

Consistently supported programs for improving safety at grade crossings can be effective. The payoff of such programs were discussed by James B. Clark, chief engineer, Louisville & Nashville. An abstract of his talk follows:

Possibly we could categorize grade crossing programs into those that deal with—

(1) Improving physical characteristics at crossings.
(2) Installation of fixed signs, automatic signals and gates.
(3) Designing more effective fixed signs, automatic signals and gates.
(4) Elimination of grade crossings by construction of grade separation structures.
(5) Elimination of unessential crossings by closing.
(6) Education of people using the crossings.
(7) Promulgation and enforcement of laws and regulations governing those using the crossings.

The most dramatic payoffs in grade crossing safety have been accomplished in states that have comprehensive grade crossing programs including means of financing the cost of grade crossing protection at crossings selected after thorough analysis by competent authorities. Statistics furnished by the California Public Utility Commission refer to financial assistance granted from the grade crossing protection fund on 367 crossings. Statistics for accident experience for three years before and three years after the installation of protection under the program showed that the total accidents had been reduced from 874 to 303, the number of deaths reduced from 124 to 25 and the number of persons injured reduced from 413 to 89.

There can be no question that there was a payoff on the program followed in California. However, it is also noted that even such a program can make installations where the statistics for individual crossings are not as convincing as those for the total crossings involved. It is stated that there were 37 crossings, or 10% of group covered by the fund, at which accidents increased and 24 crossings or 7% at which there was no change.

There are many other states including Illinois that have comprehensive grade crossing programs. Still more states are considering the establishment of such programs with the hope of receiving the same type of payoff that are received in the states with the programs. For instance, Florida now has under consideration legislation similar to the legislation in Illinois. Since the establishment of the grade protection fund in Illinois, in 1955, 750 crossings have been provided with modern warning signals where the new protection was partially paid for by the fund. By utilizing the fund, the Illinois Commerce Commission, despite new crossing installations, has closed sufficient crossing to show a net decrease of 217 crossings in the state since the establishment of the fund.

A safety study for 498 crossings protected by the fund where the new signals had been in service 12 months or more, indicated some significant results. Accidents were reduced by 68%, fatalities by 78% and injuries by 80%. This decrease appears even more favorable considering the increasing volume of highway traffic and automobile registration each year. The Department of Transportation was quite encouraged by the establishment of grade protection funds in Illinois, California, Wisconsin, Minnesota, Texas, Iowa, Wyoming, Colorado and Pennsylvania as these grade crossing protection funds are used to finance grade crossing projects

closings of roads, grade separations or railroad abandonments. In the same period, federal funds were also used for improving crossing protection equipment at 1,500 rail-highway grade crossings.

In addition to federal funds for the improvement of safety at rail-highway crossings, many states have allocated funds for this purpose. Illinois, for example, places $100,000 per month collected from gasoline taxes into a special grade crossing fund. Allocations from the fund are usually made by the Illinois Commerce Commission based upon requirements generated from public hearings concerning specific crossings. A typical division of costs for improved crossing protection might be 5% city, 5% county, 10% railroad and 80% state. However, in some cases, the state may pay up to 90% of the cost of improvements at established or new crossings.

Several speakers said that much can be accomplished by personal contacts at local levels. Often such informal meetings among railroad men, highway and/or traffic engineers, attorneys, etc. and others can provide solutions whereby public hearings may not be required. In other instances, requests to state regulatory bodies are made with all in agreement, thereby obtaining favorable decisions. Southern Pacific, for example, has eight full time men working with public agencies in this area of rail-highway grade crossing safety.

SP's chief engineer- system, Harry M. Williamson, also pointed out that installation of gates at all crossings on the road's San Francisco-San Jose commuter line reduced crossing fatalities 94% over a 24-year period. And this reduction was made when highway traffic was increasing six-fold. Williamson said that California now pays for maintenance of crossing protection equipment on the same basis as funds are expended for installation of this equipment. This applies only to crossings at which equipment was installed since the law was enacted in 1967.

Upgrading a rail-highway grade crossing too often means only the installation of flashing-light signals with or without automatic gates. However, such crossings can be upgraded or the safety at them improved by removing obstructions to views of the tracks or approaching trains, often called improving sight distances. The roadway may be straightened, pavement resurfaced and the roadway at the crossing itself smoothed or improved. Also of importance, is the matter of signing. Too often, today's signs are for yesterday's speeds, namely, that many crossing signs are not really readable at approach speeds of 60 mph or more.

The approach signs should clearly indicate to the motorist that he is nearing a rail-highway crossing. Identity should be clear regardless of the motorist's speed of approach. Also, signs should tell him what to look for and when. A uniformity in signing could breed good habits into motorists.

One way to improve safety at rail-highway grade crossings is to form diagnostic study teams to go to actual crossings, study the conditions, analyze the situations and formulate plans for improvements. Dr. Neilon J. Rowan, head, driver environment department, Texas Transportation Institute, Texas A&M University, suggested that such diagnostic teams include people from railroads, highway departments, highway designers, traffic engineers, municipalities involved, maintenance personnel—in other words, representatives from all involved in or concerned with crossing safety. The team, to be most effective, should consist of people who can then carry out the suggestions of the study—people who can get the necessary improvements done.

One of the age old problems that is familiar to signal engineers is the one of providing crossing protection equip-

safety, better signing, lower costs and better understanding.

on non-federal-aid roads. The federal government has given much thought to giving matching funds to those states that have a grade protection fund for the installation and signalization of crossings not on federal aid roads.

J. A. Parker, chief railroad engineer, Illinois Commerce Commission, states that the Commission and its staff became very active in promoting projects for protecting conveniently located crossings and closing all others in a particular area or community. He states: "A conservative estimate of the total number of Illinois communities involved in these projects for all crossings, along a particular railroad are either protected or closed, would be near 400. An early example was at Lincoln, Ill., where the GM&O ran directly through the middle of town. Gates and signals were installed at seven crossings on December 1, 1939. At the same time, the five remaining crossings there were closed to vehicular traffic. In a ten-year period preceding that date, 50 persons had been injured, 26 fatally, at the twelve crossings. During the following 29 years up to now, 2 accidents have been recorded, only one of which was fatal, and that involved a pedestrian crossing on a sidewalk which had been left when the roadway was closed."

On our own railroad we have worked with various communities including such small ones as Pewee Valley, Ky., and large ones such as Louisville, Ky., New Orleans, La. and others. At Louisville, we had four grade crossings located on a stretch of multiple tracks extending between our two main yards. The four crossings were protected by gates and watchmen but even with such protection there were still accidents at the crossings. The city proposed the installation of an overhead bridge to replace one of the crossings and the L&N was asked to participate in the cost of the new structure. In the consideration of the entire problem, the city agreed to close an additional crossing at which it would be almost physically impossible to ever place a grade separation structure. The second crossing to be closed was probably more dangerous than the one that was included in the original plan. It was closer to one of the yards and there was a "T" street intersection immediately west of the multiple tracks. The payoff on the original project of completely eliminating one crossing was at least doubled by eliminating a second crossing and directing all of the traffic from both crossings to the new overhead bridge.

At Lewisburg, Tenn., there was only one crossing inside the city limits. That crossing was especially dangerous due to an industrial plant with large employment adjacent to the track and at the dead end of the street. In addition, there was and still is a passenger train scheduled to pass the plant at almost precisely the time that the employees from the plant go home to lunch by automobile. A three-way program was worked out involving the railroad, the city and the plant in which a new street was constructed that permitted better access to the plant from a street that crossed the railroad by overhead bridge. The payoff from the original overhead bridge installation was stretched to include the benefits from the elimination of the only grade crossing in the city and directing all of the people who used the grade crossing to an overhead bridge.

We are now in the process of working on the railway-highway grade crossing program being conducted by the Bureau of Public Roads, involving a complete inventory of crossings throughout the entire United States to be followed by an active program.

ment that operates only when a train is to move over a crossing, and will keep delays to vehicular traffic to a minimum. Also, such equipment and controls must be "cheap." This problem was brought up at the Urbana conference. A solution would be for massive federal research and development programs to produce the inexpensive controls in plentiful quantities. But most conferees agreed that it is most difficult now to obtain money for improved crossing protection equipment or R&D for better equipment.

Grade crossing protection equipment, by its nature is 10% visible—flashers and gates—and 90% invisible to the motoring public. This 90% is the controls to actuate the flashers when trains approach and turn them off after trains pass over the crossing. With high speed train operation, the controls become more complex because of the mixing of high speed and low speed trains. And with increased train speeds, is the ever present problem of the tremendously expanding motor vehicle usage which demands that delays be kept to minimums.

It seems like a never-ending circle, but at least the manufacturers' and some railroad viewpoints were expressed at the conference where highway and public officials could take heed. An unseen cost of grade crossing protection equipment is installation labor. "Today installation labor costs almost as much as the equipment. A reduction in 50% in material cost will result in approximately a 25% reduction in total cost," said John W. Hansen, manager-marketing communications, Signal & Communications division, Westinghouse Air Brake Company.

Innovation, he said, can be limited by public regulations imposed by many states that require a change in law to approve a simple change, such as replacing black and white reflective striping on gate arms with more effective red and white. "No railroad will attempt to improve its equipment if it is not in accordance with existing standards and regulations. The legal implications of non-conformance are obvious.

"We find that improved products tend to make older equipment still in service subject to legal claims that the protection was not as good as it might have been. This should not be allowed to affect product improvement, but it is a problem today.

"The installation rate of grade crossing equipment could be accelerated if some form of incentive could be created that would provide an economic justification for the railroads. The size of today's market is being established by the regulatory bodies, and the only choice available to the railroads is the source of equipment," Hansen said.

One of the factors used by some states to determine whether a rail-highway crossing should be provided with automatic protection is known as exposure level. This is determined by multiplying the number of motor vehicles per day traveling over the crossing by the number of trains per day moving over the same crossing. A basic minimum for Illinois to upgrade protection from a crossbuck to automatic signals is 3,000 vehicles per day and at least 2 trains per day over the same crossing. For single-track crossings in rural areas an exposure level of 25,000 is considered justifiable for automatic protection. For urban areas in single-track territory, the exposure level is 50,000. For multiple track territories, rural exposure level is 15,000 and urban exposure level is 30,000.

Illinois has a continuing program of inspecting rail-highway grade crossings. Each highway district in the state hires a man during summer months to inspect crossings. Some of these inspectors are high school teachers. According to Harold E. Ruffner, district engineer of traffic, Illinois Division of Highways, reports of these annual inspections are sent to the railroads and the highway department. Often, a railroad man will accompany the highway inspector when he surveys crossings.

The whole gambit of signs, protection equipment, sight distances, roadway geometrics, etc., must be designed to accommodate and fit the requirements of the motorist. A major problem is that when danger is greatest at the crossing, motorists probably will not act rationally. Additionally, said Robert E. Conner, chief, engineering division, office of traffic operations, Bureau of Public Roads, there is a greater need for more visual aids for motorists now that standard equipment in cars is a radio, and many cars are equipped with air conditioning so that in summer a driver can operate with his windows closed.

One of the problems of law enforcement at grade crossings is that with today's crime rates, most law enforcement agencies often do not have the time or the personnel to devote to crossing safety enforcement. However, several law enforcement agency representatives said that police are cooperating with railroads in the "near-miss' programs. A near-miss occurs when a tank truck driver or a school bus driver passes over a crossing so close to a train as to cause the locomotive engineer to make an emergency brake application. The train crew reports the near-miss and a law enforcement officer calls on the driver.

VIEW FROM THE CROSSARM:

Board sets raise for signalmen

Presidential Emergency Board No. 175 in its report of March 7, recommended that the Brotherhood of Railroad Signalmen accept the railroads' general wage increases of 3.5% effective July 1, 1968; 2% effective Jan. 1, 1969 and 3% effective July 1, 1969. Further, the Board recommended that signalmen and signal maintainers be granted a 20¢ per hour adjustment to be effective July 1, 1968. Also, the Board turned down the BofRS demand for a cost-of-living adjustment.

Discussion and recommendations (in detail) of the Board are as follows:

As we repeatedly indicated to the parties both at the hearing and in our mediation efforts, we view the case as primarily concerned with the skilled wage inequity adjustments which the Electricians A, members of the so-called shopcraft group, received under the September 15, 1967 determination of the Special Board, created by Public Law 90-54, commonly known as the Morse Board. These adjustments consisted of four 5¢ increases, effective April 1, 1967; October 1, 1967; April 1, 1968; and October 1, 1968.

Neither party grants that determinative weight should be given to a comparison between the thus-established wages of Electricians A and the wages of Signalmen (we use the term generically to include all skilled employees represented by the Organization [BofRS], i.e., all Signalmen and Signal Maintainers and all other equal or higher rated employees). Requesting inequity (and general-wage) adjustments of a much greater magnitude, the Organization—though pointing to the Electricians' wages as a factor that needs to be taken into account—urges a host of other comparative measures as well as a series of more general considerations. The Carriers [railroads], though their overall position is of course also made up of numerous and varied contentions, flatly oppose

CREATION OF THE EMERGENCY BOARD

Emergency Board No. 175 was created by Executive Order 11445, issued January 13, 1969, pursuant to Section 10 of the Railway Labor Act, as amended, to investigate and report its findings of the unadjusted dispute between the railroad carriers represented by the National Railway Labor Conference (comprised of the Eastern, Western, and Southeastern Carriers' Conference Committees) and certain of their employees represented by the Brotherhood of Railroad Signalmen, a labor organization.

President Johnson appointed the following persons as members of the Board: Laurence E. Seibel, attorney and arbitrator from Washington, D.C., Chairman; Dr. Jacob Seidenberg, attorney and arbitrator from Falls Church, Virginia, Member; and Rolf Valtin, arbitrator from Washington, D.C., Member. Shortly after the appointment of the Board, the parties agreed to extend the time within which the Board must report its findings to the President until March 7, 1969. On February 6, 1969, this extension was approved by President Nixon.

The Board convened in Washington, D.C., on February 6, 1969, to discuss procedural matters with the parties, and thereafter for nine days between February 7 and February 17, 1969, held public hearings in Washington, D.C., at which the parties were given full opportunity to present evidence and argument. Subsequently, the Board attempted to mediate the dispute.

The Organization represents approximately 10,000 employees who are engaged primarily in the installation, inspection, maintenance and repair of railroad signal devices and related equipment. These employees are classified by the Interstate Commerce Commission into several Reporting Divisions. The Organization represents virtually all employees classified into the following four Interstate Commerce Commission Reporting Divisions:

Division 45: Gang Foremen (signal and telegraph skilled trades labor)
Division 46: Signalmen and Signal Maintainers
Division 48: Assistant Signalmen and Assistant Signal Maintainers
Division 49: Signalman and Signal Maintainer Helpers

In addition, the Organization represents approximately one-half of the employees in Reporting Division 44, General and Assistant General Foremen and Inspectors (signal, telegraph, and electrical transmission), and some employees in several other Reporting Divisions. The Organization's membership constitutes about 2 percent of total railroad employment and about 3 percent of total railroad non-operating employment.

On or about March 15, 1967, pursuant to Section 6 of the Railway Labor Act, as amended, the Organization served a notice concerned with requests for wage increases. The Carriers' counterproposals to this notice were served on or about March 25, 1968.

Negotiations were conducted on both a local and a national basis. On August 16, 1968, upon failure to reach an agreement, the parties jointly invoked the services of the National Mediation Board. Mediation efforts proceeded intermittently between September and December. On December 2, the National Mediation Board advised the parties that its efforts had been unsuccessful and urged them to submit the controversy to arbitration. The Organization declined the proffer, while the Carriers indicated their willingness to accept it.

On December 16, the National Mediation Board advised the parties that its services had been terminated under the provisions of the Railway Labor Act and that the employees represented by the Organization were free to withdraw their services on January 15, 1969. The Organization subsequently set a strike date for January 16. On January 13, by Executive Order 11445, President Johnson created this Emergency Board.

Shortly after the appointment of the Emergency Board, but before the proceedings had commenced, the parties agreed to withdraw, without prejudice, the Organization's notice and the Carriers' counterproposals with respect to the February 7, 1965 Job stabilization Agreement. Hence, the dispute before this Emergency Board is confined to the March 1968 notice and counterproposals.

comparison to the Electricians' rates, arguing: (a) that the Morse Board's determination was unconscionably high and that the resulting rates were never agreed to by the Carriers but, rather, were imposed by operation of law; and (b) that non-operating Organizations other than the Signalmen's Organization—particularly those of the Clerks and of the Maintenance of Way employees—represent some skilled employees of various sorts and that these Organizations have accepted skilled inequity adjustments comparable to the skilled inequity adjustment which the Carriers have offered the Signalmen.

We think the following matters are of overriding significance.

First and foremost, we turn to a comparison in terms of the *nature of the work performed and the type and degree of skill and knowledge required.* Electricians and Signalmen are not identical—no comparison is perfect—but we think it is clear that they are substantially comparable in these respects. We have been led to a number of considerations which confirm it, but perhaps the most telling confirmation lies in the following statement from the Report of Emergency Board No. 159 (which considered the skill level of Signalmen):

". . . Under General Order 27 of the Director General of Railroads, as supplemented in 1920, which both parties have referred to as the last time when there was a systematic classification of the various skilled crafts of railroad labor, signalmen and signal maintainers were placed *in the category of electrical workers first class* and received the same hourly rate as shopcraft employees in the journeyman or mechanic's category." (Emphasis supplied.)

The Carriers have neither challenged the validity of this statement nor contended that there has been a lessening in the level of the Signalmen's skill since the Report of Emergency Board No. 159 was issued in 1964.

Second, until the advent of the Morse Board determination, there had long been the closest of wage relationships between the Signalmen and the Electricians A. The table (p. 24) covers the period commencing with 1949. It is to be noted, however, that one can go back many more years and find quite the same picture of consistent parity.

Disregarding the figures which apply from January 1, 1967, the date from which the Morse Board determination was effective, it seems to us that one cannot help but conclude that these three parties (the Electricians, the Signalmen and the Carriers) have for years in effect been saying that Electricians and Signalmen are "worth" just about the same wages.

We are aware that the Clerks group and the Maintenance of Way group—so heavily stressed by the Carriers as examples of non-operating employees who settled in the current wage round with inequity adjustments well below the shopcraft inequity adjustment—have also had a long parallel wage relationship with the Electricians (and various other non-operating employees). However, though the evidence on job comparability is fragmentary, we have not been convinced that these two groups can similarly be compared to Electricians from the three-fold standpoint of type of work, skill and knowledge.

Third, and here we answer the Organization's plea for the use of various "outside" wage comparisons, it seems to us unquestionably true that the Electricians' 1967-68 skilled inequity adjustment is the most compelling basis for determining the size of a skilled inequity adjustment for the signalmen

Not only does the Electricians' adjustment beg for consideration because it is "close to home" but also it is an adjustment which is itself founded on a conglomerate of yardsticks.

Fourth, we are aware of the Carriers' strong feelings about the shopcraft determination but we do not think that we can be concerned with whether it was arrived at by agreement or imposed by a law-created Board; who the members of the board were; whether a different Board would have made different assessments, etc. It is the *fact* of the determination and its implementation which matters. In short, the Electricians' current rates "are there," and it is this which has brought about the disruption of the long and consistent wage relationship between the Electricians and the Signalmen.

On the skilled inquity issue, accordingly, it is our recommendation, as clarified and elaborated upon immediately below, that the Signalmen (as defined earlier) be granted a 20¢ per hour adjustment.

(1) We are aware that, on the one hand, the Carriers would prefer to establish a fund from which to make selective distributions based on particular local conditions; and that, on the other hand, the Organization would prefer to have the adjustment applied in terms of a uniform percentage to all the skilled employees. Whatever the virtues in either approach, we think they contain problems which outweigh them. With respect to the Carriers' approach, there could be endless disagreements as to who should receive how much and how little, and—especially since, as will be seen, we are recommending an agreement of relatively short duration—we think that the fund undertaking at this stage would not be in the interest of stability. With respect to the percentage approach, the difficulty is twofold.

Pay rates are similar for signalmen and electricians

Dates	Electricians A	Signalmen East	Signalmen (Southeast and West)
9/1/49	$1.7380	$1.7500	$1.7260
2/1/51	1.8630	1.8750	1.8510
12/1/52	1.9030	1.9150	1.8910
12/3/54	2.0330	2.0450	2.0210
12/1/55	2.1780	2.1900	2.1660
11/1/56	2.2780	2.2900	2.2660
11/1/57	2.3480	2.3600	2.3360
11/1/58	2.4180	2.4300	2.4060
7/1/60	2.6380	2.6500	2.6260
2/1/62	2.6780	2.6900	2.6660
5/1/62	2.7408	2.7528	2.7288
1/1/64	2.8308	2.8528	2.8288
1/1/65	2.9450	2.9528	2.9288
1/1/66	3.0475	3.0528	3.0288
1/1/67	3.2304	3.2054	3.1802
4/1/67	3.2804	3.2054	3.1802
10/1/67	3.3304	3.2054	3.1802
1/1/68	3.3304	3.2855	3.2597
4/1/68	3.3804	3.2855	3.2597
7/1/68	3.5494	Not yet determined	
10/1/68	3.5994		

COUNTERPROPOSALS OF THE CARRIERS

1. **Compulsory Retirement**

All employees subject to the provisions of this Agreement who are seventy years of age or over must retire from active service no later than ninety days subsequent to the effective date of this Agreement. Thereafter, the mandatory retirement age shall be progressively lowered until it is 65 in accordance with the following schedule:

July 1, 1968—69 years of age
January 1, 1969—68 years of age
July 1, 1969—67 years of age
January 1, 1970—66 years of age
July 1, 1970—65 years of age

Existing agreements which provide for retirement at an earlier age than herein set forth remain in full force and effect.

All agreements, rules, regulations, interpretations and practices, however established, which conflict with the above shall be eliminated, except that any existing rules, regulations, interpretations or practices considered by the carrier to be more favorable may be retained.

2. **Elimination of Sick Pay Rules**

The Congress having provided for the payment of sickness benefits in amendments to the Railroad Unemployment Insurance Act, it is proposed that:

All agreements, rules, regulations, interpretations and practices, however established, providing for compensation when employees are absent because of sickness, or that vacancies resulting from absence from duty because of sickness be filled, be eliminated.

All agreements, rules regulations, interpretations and practices, however established, which conflict with the above shall be eliminated.

3. **Emergency Force Reductions**

Establish a rule or amend existing rules to provide that in the event of a strike or emergency affecting the operations or business of the Carrier, no advance notice shall be necessary to abolish positions or make force reductions.

All agreements, rules, regulations, interpretations and practices, however established, which conflict with the above shall be eliminated.

4. **Monetary Claims**

Establish a rule to provide that no monetary claim based on the failure of the carrier to use an employee to perform work shall be valid unless the claimant was the employee contractually entitled to perform the work and was available and qualified to do so, and no monetary award based on such a claim shall exceed the equivalent of the time actually required to perform the claimed work on a minute basis at the straight time rate, less amounts earned in any capacity in other railroad employment or outside employment, and less any amounts received as unemployment compensation.

Existing rules, agreements, interpretations or practices, however established which provide for penalty payments for failure to use an employee contractually entitled to perform work shall be modified to conform with the foregoing, and where there is no rule, agreement, interpretation or practice providing for penalty pay, none shall be established by this rule.

All agreements, rules, regulations, interpretations and practices, however established, which conflict with the above shall be eliminated, except that any existing rules, regulations, interpretations or practices considered by the carrier to be more favorable may be retained.

5. **Discipline and Investigation**

Amend all existing rules, agreements, interpretations or practices, however established, dealing with discipline and investigation in such manner so as to make the following effective:

It is found that an employee has been unjustly suspended or dismissed from service, such employee shall be reinstated with his seniority rights unimpaired and be compensated for wage loss, if any, suffered by him resulting

First, we cannot be certain what the percentage figure would be which would equate, in cost to the Carriers, to 20¢ for all the skilled employees. Second, the primary concern here is with restoring the former wage relationship between the Electricians' rate and the Signalmen's *basic* rate. And, as there is a significantly large number of employees whose rate is above the basic rate, the application of the percentage figure which equates to the 20¢ cost would necessarily mean an adjustment of *less than* 20¢ to the "basic" employees. Again, our concern is one of stability: we do not think it would be served by an application under which the higher classified employees would receive an adjustment of more than 20¢ while the great bulk of the Organization's skilled employees would receive less than 20¢—or, stating it otherwise, by an adjustment which, for this bulk of the employees, would fail to restore the former Electrician-Signalman wage relationship. For these reasons, we have concluded, and we so recommend, that the inequity adjustment should be in the form of 20¢ per hour for all the skilled employees.

(2) As a matter of eliminating any question about it, we state our opinion that the 20¢ adjustment for the employees who are paid on a monthly basis should be applied on the basis of the comprehended number of hours per month. What matters here is not that the number of hours actually worked is on the average well below the comprehended number of hours but that the monthly-paid employees are subject to working all the comprehended hours and that the parties have made a special arrangement which incorporates the non-payment of overtime rates for certain hours which otherwise would be paid for at overtime rates.

(3) For the following reasons, we recommend that the entire 20¢ adjustment be made effective as of July 1, 1968 and be applied as if it had gone into effect *in advance of* the general percentage wage increase to be applied as of that date.* First, given the lag vis-a-vis the Electricians, we think it would be inequitable to apply the adjustment for the Signalmen in the same four-stage fashion in which the Electricians received it. Second, when one takes into account the compounding effect of the Electricians' 1968 general percentage wage increase on the portion of their inequity adjustment which had gone into effect by the time the 1968 percentage increase was applied, one comes closest to restoring the former Electrician-Signalman wage relationship by first applying the 20¢ adjustment to the Signalmen's rates and thereupon applying their general percentage wage increase.

On the issues of the cost-of-living-adjustment clause, the general wage increase and the duration of the Agreement, our conclusions are essentially the same as those of Emergency Board No. 174, whose Report was issued less than a month ago, on February 12, 1969.

We quote a portion of its conclusion with respect to the cost-of-living-adjustment issue:

"Escalator arrangements of this sort are not unknown to the railroad industry, although they have been used less in this industry than in some others. Such provisions were included in railroad collective-bargaining agreements between 1956 and 1959. However, it appears that in 1960 the railroads and the unions involved saw fit to discontinue all or most of those that they had. We are not shown very convincing reasons why the Board should recommend the reintroduction of escalator arrangements that the parties had abandoned."

We concur, and we therefore recommend that the Organization withdraw this demand.

We think that the Organization has not effectively contested the Carriers' proposal for an Agreement of 18-month duration and that the Carriers have

The assumption here is that the 3.5 percent general wage increase which we are recommending for the second half of 1968 will be accepted and applied.

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from said suspension or dismissal less any amount earned, or which could have been earned by the exercise of reasonable diligence, during such period of suspension or dismissal.

All agreements, rules, regulations, interpretations or practices, however established, which conflict with the above shall be eliminated except that any existing rules, regulations, interpretations or practices considered by the carrier to be more favorable may be retained.

6. **Entering Rates**

Establish a rule, or amend existing rules, to provide that entering rates of pay shall be 80% of the established rates, with increases of four per cent (4%) of the established rate effective on completion of the first and each succeeding year of compensated service until the established rate is reached.

All agreements, rules, regulations, interpretations and practices, however established, which conflict with the above shall be eliminated, except that any existing rules, regulations, interpretations or practices considered by the carrier to be more favorable may be retained.

7. **Assignment and Use of Employees**

The carrier shall not be required to work an employee if working him would entail payment to him of more than the straight time rate, and use of another person in his place shall not be basis for claims of an employee not used.

All agreements, rules, regulations, interpretations and practices, however established, which conflict with the above shall be eliminated, except that any existing rules, regulations, interpretations or practices considered by the carrier to be more favorable may be retained.

8. **Prohibition Against Multiple Time and One-Half Payments on Holidays**

Under no circumstances will an employee be allowed more than one time and one-half payment for service performed by him on any day which is a holiday.

All agreements, rules, regulations, interpretations and practices, however established, which conflict with the above shall be eliminated, except that any existing rules, regulations, interpretations or practices considered by the carrier to be more favorable may be retained.

9. **Forty-Hour Work Week Rules**

A. Eliminate all agreements, rules, regulations, interpretations and practices, however established, applicable to the forty-hour work week which are in conflict with the rule set forth in Paragraph B.

B. Establish a rule to provide that:

1. The normal work week of regularly assigned employees shall be forty hours consisting of five days of eight hours each, with any two consecutive or nonconsecutive days off in each seven. Such work weeks may be staggered in accordance with the carrier's operational requirements.

2. Regular relief assignments may include different starting times, duties and work locations.

3. Nothing in this rule shall constitute a guarantee of any number of hours or days of work or pay.

4. Work performed by a regularly assigned employee on either or both of his assigned rest days shall be paid for at the straight time rates, unless the work performed on either of the assigned rest days would require him to work more than forty straight time hours in the work week, in which event the work performed on either of his rest days in excess of forty straight time hours in the work week shall be paid for at the rate of time and one-half.

5. Any overtime worked by the employee will be computed into straight time hours and be used for purposes of determining when he has completed his forty-hour work week but not for the purpose of determining when the time and one-half rate is applicable.

All agreements, rules, regulations, interpretations and practices, however established, which conflict with the above shall be eliminated, except that any existing rules, regulations, interpretations or practices considered by the carrier to be more favorable may be retained.

brought convincing support for this proposal. We recommend that it be adopted.

With respect to the general wage increase, the Carriers have offered: 3.5 percent effective July 1, 1968;* 2 percent effective January 1, 1969; and 3 percent effective July 1, 1969. The Carriers' argument is that the offer conforms to the pattern for the current wage round in the railroad industry; that 65 percent of all railroad employees—another 10 percent were covered in the proceeding before Emergency Board No. 174—have accepted it; that this includes the employees represented by all the other non-operating organizations, with the exception only of the shopcraft organizations (whose negotiations for the current round have not yet begun); and that the Carriers' policy of equality of treatment among the many labor organizations with which they must deal is of critical importance to all concerned.

Here again, our conclusion so closely parallels that of Emergency Board No. 174 that we once more quote a portion of its Report:

"This Board agrees with the Organization that the fact that other unions may have accepted a particular pattern of wage increases is not of itself adequate reason why ORCB should accept the same pattern. Each organization is entitled to have its wage demands considered on their own merits. Nevertheless, the fact that a large number of other unions have accepted a particular settlement is a fact of which the Board must take cognizance. A wage increase acceptable to the majority of major railroad unions representing more than a majority of railroad employees is presumptively not grossly unfair or inadequate. . . ."

We think that it was in the skilled inequity area, not the general-wage-increase area, that the Organization had a special problem which begged for a special response. We have so responded. Our recommendation on the skilled inequity adjustment covers approximately 80 percent of the employees represented by the Organization. Together with the general wage increases offered by the Carriers, the vast majority of the Organization's members would receive a three-step increase totaling about 14½ percent over an 18-month period. In terms of the rise of the basic Signalman rate, it is a matter of going from $3.2855 to $3.7901 in the East and from $3.2597 to $3.7620 in the Southeast and West. It simply cannot be contended that this is anything less than substantial wage progress.

We recommend, therefore, that the Organization accept the general wage increases which the Carriers have offered.

The parties have informed us that they are in agreement on three matters, which would be adopted if a settlement of this dispute were effected. These are: (a) the insurance item growing out of the September 1, 1967 notice; (b) the "guarantee" of the eight holidays, subject to the preclusion of multiple time-and-a-half payments for work performed on the holidays; and (c) the lowering of the service requirement for two weeks of vacation from three years to two years.

Finally, we recommend that all proposals advanced by either party which are not disposed of by this Report be withdrawn.

PROPOSALS OF THE ORGANIZATION

A. **Adjustment of Straight Time Wage Rates**

1. *First Year Wage Increase.* Increase all straight time rates of pay for employees covered by the agreement by an amount equal to ten percent (10%) effective July 1, 1968, applied so as to give effect to this increase in pay irrespective of the method of payment.

2. *Second Year Wage Increase.* Increase all straight time rates of pay for employees covered by the agreement by an amount equal to eight percent (8%) effective July 1, 1969, applied so as to give effect to this increase in pay irrespective of the method of payment.

3. *Third Year Wage Increase.* Increase all straight time rates of pay for employees covered by the agreement by an amount equal to seven percent (7%) effective July 1, 1970, applied so as to give effect to this increase in pay irrespective of the method of payment.

B. **Additional Adjustment of Straight Time Wage Rates Paid to Skilled Employees**

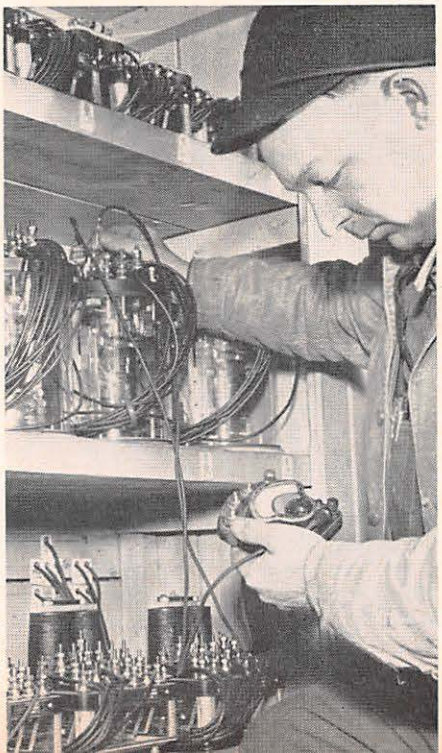
1. *First Year Skill Differential.* Increase all straight time rates of pay provided for in part A of this notice for Signalmen, Signal Maintainers, and all others occupying generally recognized mechanics' or higher rated positions covered by the agreement in the amounts of thirty (30) cents per hour effective July 1, 1968, and fifteen (15) cents per hour effective January 1, 1969, applied so as to give effect to these additional increases in pay irrespective of the method of payment.

2. *Second Year Skill Differential.* Increase all straight time rates of pay provided for in parts A and B, 1 of this notice for Signalmen, Signal Maintainers, and all others occupying generally recognized mechanics' or higher rated positions covered by the agreement in the amounts of fifteen (15) cents per hour effective July 1, 1969, and fifteen (15) cents per hour effective January 1, 1970, applied so as to give effect to these additional increases in pay irrespective of the method of payment.

3. *Third Year Skill Differential.* Increase all straight time rates of pay provided for in parts A and B, 1 and 2 of this notice for Signalmen, Signal Maintainers, and all others occupying generally recognized mechanics' or higher rated positions covered by the agreement in the amount of fifteen (15) cents per hour effective July 1, 1970, applied so as to give effect to this additional increase in pay irrespective of the method of payment.

C. **Cost of Living Adjustment**

Wage rates established in accordance with paragraphs 1, 2 and 3 of parts A and B above shall be subject to a cost of living adjustment effective October 1, 1968, and each quarter year thereafter. Such cost of living adjustment shall be in the amount of one (1) cent per hour for each three-tenths (0.3) of a point change in the Bureau of Labor Statistics Consumer Price Index above the base index figure for June 1968, except that it shall not operate to reduce wage rates below those established under paragraphs 1, 2 and 3 of parts A and B above.



We have heard a great deal from the Organization, but mistakenly, about the fact that the Electricians received a 5 percent increase as of July 1, 1968. The Electricians received a 6 percent increase for the 18-month period from January 1, 1967 until July 1, 1968 and thereupon the 5 percent increase for the remainder of 1968. The Organization, on the other hand, received a 5 percent increase for the 12-month period commencing on January 1, 1967; a 2.5 percent increase for the first half of 1968; and, by the Carriers' proposal, would receive a 3.5 percent increase for the second half of 1968. In each case, it is a matter of 11 percent covering the 2-year period.

Product News

Telephone Shelter

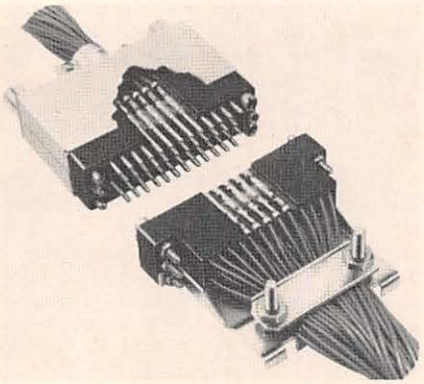
A new telephone shelter box, known as the CDX-303, for wayside telephone installations is of 12-gauge steel. It has a steel roof which overhangs forward to provide the user protection from the weather, and slopes to the rear for water run-off. The door is gasketed to protect the interior and prevent possible nesting of insects.

When the door is opened, a spring-loaded type-16A door switch (which is optional equipment), connects the telephone to the open wire line and, in reverse, it serves to disconnect the phone and eliminate bridging when not in use. Inside the box, a painted, plywood backboard fills the rear wall of the cabinet for mounting of telephone equipment. Also, a hook is provided for a lantern.

The CDX-303 unit is painted standard telegraph-grey, but other color schemes, railroad name and insignia can be applied upon order. The instruction: "Always Close and Lock Door" is stenciled on the door. The box can be secured with padlock at bottom of door, or under door handle. A 3" channel steel bracket is welded at rear of the cabinet for pole mounting of unit, at recommended height of 3½ ft from ground level. Dimensions of the CDX-303 are: height 31¾", width 24", depth 13½" and contents 5⅙ cu ft. *Western-Cullen Div., Federal Sign & Signal Corp. Circle 101 on Reader Service Coupon.*

● INVERTERS: Sine wave inverters are complete solid state devices that convert DC power to AC power. They may either be connected during power failure only or for "no-break" operation in which a charger connected to an AC source supplies the DC requirements of both the battery and the inverter. The inverter supplies the AC requirement of the load. Specifications and dimensions are provided in a sine wave inverter brochure. *Nife Inc. Circle 102 on Reader Service Coupon.*

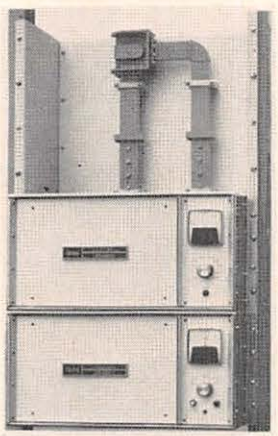
● TRACK CIRCUIT: The pulse modulated track circuit, PMTC, is a specially controlled audio frequency system for use in approach circuits for grade crossing protection, block detector circuits and other track circuit applications where ordinary tone systems would not be acceptable because of external interference. Descriptions and electrical characteristics and specifications of the PMTC is provided in catalog 40. *Marquardt Industrial Products Co. Circle 103 on Reader Service Coupon.*



Circuit Connectors

New electrical connectors have crimp-type, snap-in contacts. The formed pin and sockets contacts are quickly crimped by hand or power tooling and then pushed into place in the connector housing where spring contacts lock them into proper position.

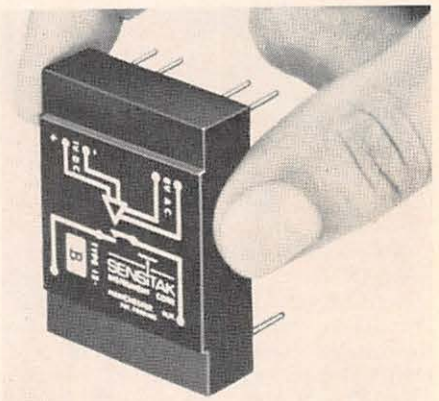
Contacts are available for sizes #14 through 30 AWG in gold-over-nickel plating. Housings are available in 24 various contact configurations in glass-filled phenolic or diallyllphthalate inserts with aluminum alloy housings. Completed connectors have all necessary hardware options for free-hanging, panel, or rack-and-panel use. *American Pamcor Inc. Circle 104 on Reader Service Coupon.*



Microwave

A new all-solid-state microwave system is now available for operation in the frequency bands between 5925 and 6875 MHz. Type SS6000 can handle up to 600 multiplexed voice channels or their equivalent in data. The transmitter provides one watt into the antenna line with power consumption of about 50 watts. Each transmitter and receiver occupy 8¾" of rack or cabinet space.

Total noise and distortion per hop is specified at less than 15 dba0. Type SS6000 equipment can be used in medium to long-haul systems with back-to-back repeaters to provide complete baseband accessibility at each repeater point without degrading end-to-end circuit performance. *Farinon Electric. Circle 105 on Reader Service Coupon.*



Metering Relays

Metering relays that combine a silicon solid state amplifier with a dry reed relay provide overvoltage and undervoltage sensing with either automatic reset or electrical latching. The units provide a means of monitoring line voltages from 1 to 500 volts DC as well as load current. In conjunction with combinations of resistors and blocking diodes, the relays can perform many types of logic functions.

Known as Sensitak models 11 and 12, the new Struthers-Dunn metering relays are available in four types: undervoltage "on-off", undervoltage latching, overvoltage "on-off" and overvoltage latching. All require an 8 volt, 60 or 400 Hz primary AC power supply and a low level DC signal input.

Standard relays have an input impedance of 1,000 ohms and close their electrically isolated, normally-open dry reed relay contacts at DC signal levels of 1 volt and/or 1 ma. Internal temperature compensation maintains these operate values over a wide ambient temperature range. Signal strength may vary to a maximum of 10 volts, resulting in a 10:1 operating voltage range ratio. With external series resistances, the modules may be used to monitor DC voltages from 1 to 500 volts. The units also operate on square or rectangular DC pulses and on the rms value of rectified AC.

Measuring only 2" by 1½" by 9/16" deep exclusive of wire terminals, the units are epoxy encapsulated and equipped with two threaded nylon studs for chassis mounting. Straight wire terminals accommodate soldered connections when P/C board mounted.

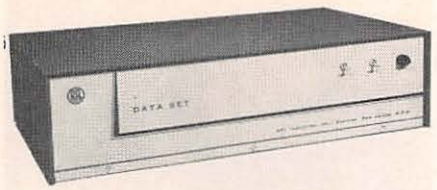
A companion power supply, Sensitak Model 13, is also available to provide one

(Please turn to page 28)

PRODUCT NEWS

(Continued from page 27)

or two of these metering relays with isolated 8 volt AC primary power to a maximum of 30 ma. from any standard 115 volt, 60 or 400 Hz supply. *Sensitak Instrument Corp. Circle 106 on Reader Service Coupon.*



Data Sets

A new series of data sets which, under new FCC tariffs effective Jan. 1, 1969, will connect directly to a standard telephone line. These 2056 data sets are two and three state, (suited to return-to-zero operation) which operate at bit rates of 60, 85, 110, 150, 300, 600, 1200 and 1800. Digital interfaces may be either positive neutral, negative neutral or polar (EIA/RS232B). A variety of mounting configurations are available. *RFL Industries, Inc. Circle 107 on Reader Service Coupon.*

FM Monitor

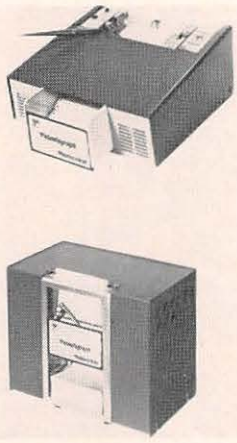
A new multi-channel FM communications monitor accommodates up to 23 channels between 20 and 1150 MHz and combines the flexibility of modular plug-ins with the ability to make off-the-air measurements up to 50 miles away. Called the CE-7, the new instrument gives users a choice of either a plug-in oscilloscope or a plug-in meter, for deviation display, and a choice of three high-sensitivity RF preselector plug-ins which cover 25-50 MHz, 145-175 MHz, and 450-512 MHz. A broadband mixer plug-in covering all bands is also available. It can be substituted for the RF preselectors when the CE-7 is used for local monitoring and in-shop measurements.

Included on the CE-7 is a simple knob that allows operators to select any one of 23 frequencies in the FM communications spectrum. A lighted, digital display shows channel number. Once the channel is selected, frequency error and FM deviation can be read simultaneously. The whole process takes less than 10 seconds. Frequency accuracy exceeds .0001% long term.

The CE-7 oscilloscope plug-in has front panel connectors for applying signals to both the vertical and horizontal amplifiers for routine testing, troubleshooting, displaying Lissajous patterns and other service jobs requiring a high quality scope display.

Besides measuring frequency error and FM deviation, the CE-7 generates CW or FM signals, with output calibrated in microvolts, for any of the 23 selected carrier frequencies. It also generates up to 10 different IF frequencies between 250 KHz and 13.5 KHz; and provides a 1 KHz variable level signal for modulating a transmitter while monitoring frequency error and deviation.

All circuitry on the CE-7 is solid state and the unit weighs only 35 lb, including plug-ins. Every CE-7 is factory wired for use with accessory meters for display of frequency error and FM deviation up to several hundred feet from the instrument. *Cu hman Electronics. Circle 108 on Reader Service Coupon.*



Writing Device

Model DS telescriber permits instant transmission of handwritten messages to selected unattended receivers any distance via telephone lines or microwave. Ballpoint pen writes directly on specially designed preprinted forms or plain roll paper with multiple copies available at both ends. Standard ink cartridge refills simply. Machines turn off automatically. Desk top units feature solid state electronics and circuit boards. *Telautograph Corp. Circle 109 on Reader Service Coupon.*

● TOWERS of the self-supporting type with 3 or 4 legs and available in heights from 40 to 310 ft in increments of 10 ft are described in catalog LM-468. Dimensions of all towers in the various incremental sizes are also presented. *Microflect. Circle 110 on Reader Service Coupon.*

● BATTERY: The Exide nickel-iron alkaline battery story is told in section 25.00a under the heading "The battery and ½". This 24-page descriptive brochure describes the history of the battery, its applications and the construction of the nickel-iron alkaline battery. *Exide Industrial Group, ESB Inc. Circle 111 on Reader Service Coupon.*

● DATA SYSTEM: The 25B data and telemetry transmission system is described, including frequency allocation plans and electrical specifications in bulletin 25B-P4, issue 1. The system uses FSK modulation and all solid-state circuitry. It operates on standard voice channels and is designed for transmission speeds up to 75, 110, 150, 200 and 600 bps. *Lenkurt Electric Co., Inc. Circle 112 on Reader Service Coupon.*

Two-way Radio

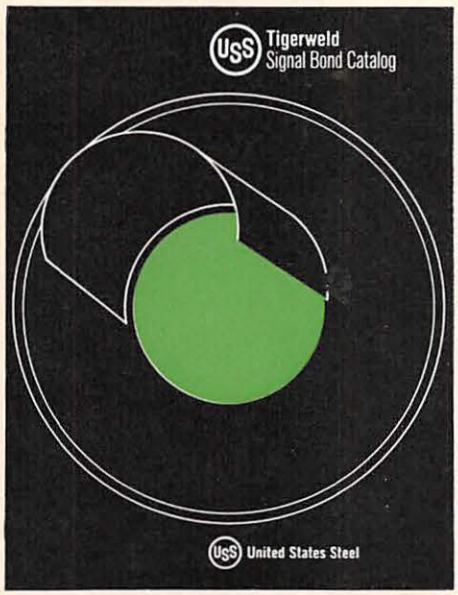
The HT 220 series "Handie-Talkie" radio is now available in the 150.8 to 174 MHz range. With 1.8 watts RF power output, the HT 220 model provides improved voice legibility and the same range as Motorola's earlier HT 200 series "Handie-Talkie" two-way radio. Receiver sensitivity of the new unit has been increased 40%, and frequency stability improved to ±.0015% from −30°C to +60°C. Two monolithic integrated circuits have replaced 51 components previously required to make up the receiver (IF) circuit and the transmitter audio (IDC) circuit. A new rechargeable nickel-cadmium energy cell weighs only 21 oz. *Motorola Communications & Electronics Inc. Circle 113 on Reader Service Coupon.*

● TONE SIGNALING is the subject of a new booklet on Datatone tone audio range signaling and control transmitters and receivers. Equipment is miniature and solid state employing no reeds, tuning forks or other mechanical vibrating elements. Up to 28 discrete tones may be individually or simultaneously transmitted. Included are application notes and circuits wherein examples are given of signaling, control and monitor functions. *Trepac Corp. Circle 114 on Reader Service Coupon.*

● TRENCHERS are covered in a new six-page bulletin which describes and illustrates 0-468 and 0-346 trenchers. This bulletin discusses power transmission, controls, starting, engine options and hydraulically assisted power steering. Each of these features is illustrated with photographs. Also included are pictures of these

(Please turn to page 31)

NEW!



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Data Modem Characteristics

Prepared by Leo J. Ritter Staff Engineer, Communications & Signals, Penn Central. Reprinted by permission of George McCann, Secretary, Communication & Signal Section, AAR.

Manufacturer	General Electric	General Electric
Model	TDM 115 Modem	TDM 210 Modem
Transmit and/or receive	Transmit & receive	Transmit & receive
Full and/or Half Duplex	Full duplex	Full or half duplex
Dial up or Private Line Application	Dial up or Private line (Acoustically coupled)	Private line
Turn around time and (HDX)	—	10, 60, 120 or 200 ms
Automatic answer capability	No	No
Type modulation	Frequency shift	Frequency shift
Operating Frequencies	1170 & 2125 Hz	1700 Hz
Clock, internal or external	None	None
Loop back testing feature	Yes	Yes
Error rate	—	—
Error detection and/or correction	—	None
EIA RS-232-B interface	Yes	Yes
Bit or character rate	Up to 300 bits/sec	Up to 1800 bits/sec
Serial or parallel transmission	Serial	Serial
Impedance to line, ohms	Acoustically coupled	600/900
Impedance to data equipment, ohms	Model 33 Teletype or RS 232-B	RS-232-B
Voltages to and from data equipment	Model 33 Teletype or RS 232-B	RS-232-B
Frequency stability	±0.5%	±1%
Level stability	—	±1 db
Output levels to line, dbm	—	−30 to +6
Input levels from line, dbm	—	−30 min.
Line requirements, frequency response	—	Voice grade
Line requirements, envelope delay	—	Voice grade
Line requirements, impedance	—	Voice grade
Line requirements, signal to steady noise	—	—
Line requirements, signal to impulse noise	—	—
Method of operation	—	2 or 4 wire
Temperature and humidity limits	−20 to +60 deg C	−20 to +60 deg C
Power requirements	115 volts AC, 10 watts	115 volts AC, 10 watts
Dimensions and weight	7" x 9" x 5", 10 lb	6" x 9" x 13¾", 12 lb
Digital or analog	Digital	Digital

(Continued from page 28)

machines in action and illustrations of the trencher trailer especially designed to carry this equipment. *Omsteel Products Corp. Circle 115 on Reader Service Coupon.*

Bus ACI

An electronic automatic bus identification system that can summon police, maintenance or supervisory assistance features a solid-state FM receiver that can be mounted on utility poles or buildings along bus routes. Each bus in a fleet would be equipped with a tiny FM transmitter which would send out a special identification signal continuously.

As the bus comes within a 50-ft radius of a wayside receiver, its signal is picked up, screened to identify specific vehicles, and transmitted to a central computer location where it is immediately available to dispatchers on an electronic wall map, a television-type display, or teleprinters. The bus signal can be picked up by the receiver even if the vehicle is traveling 75 mph.

The system minimizes the use of FCC assigned frequencies by making optimum use of telephone lines for the transmission of information from the wayside receivers to central locations.

Each vehicle is equipped with a limited range data transmitter that operates over a frequency range of 200-210 KHz. As the bus travels its assigned route, it passes permanent wayside receivers mounted on utility poles or buildings. Information sent to the receivers includes the bus "run" number that indicates its identity and the route it is traveling. The receivers also accept any of the emergency signals, if sent, at ranges up to three miles.

At the roadside receiver the signals are converted into digits and then relayed to a "data concentrator" which, in turn, passes the information into a centrally located computer. The transmissions are instantaneous. The system uses telephone lines between the receiver and the central computer.

The data concentrator receives telephone

(Please turn to page 33)

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SINGER
INSTRUMENTATION

Circle 14 on reader service card on page 38

Data Modem Characteristics

Prepared by Leo J. Ritter Staff Engineer, Communications & Signals, Penn Central. Reprinted by permission of George McCann, Secretary, Communication & Signal Section, AAR.

Manufacturer	General Electric	General Electric
Model	TDM 220 Modem	TDM 400 Modem
Transmit and/or receive	Transmit & receive	Transmit & receive
Full and/or Half Duplex	Full duplex	Full duplex
Dial up or Private Line Application	Private line	Private line
Turn around time (HDX)	—	—
Automatic answer capability	No	No
Type modulation	AM vestigial	Restored polar
Operation Frequencies	300-3,000 Hz	100-50,000 Hz
Clock, internal or external	Internal or external	Internal or external
Loop back testing feature	Yes	Yes
Error rate	—	—
Error detection and/or correction	None	None
EIA RS-232-B interface	Yes	No
Bit or character rate	Up to 2,400 bits/sec	Up to 50,000 bits/sec
Serial or parallel transmission	Serial	Serial
Impedance to line, ohms	600/900	135
Impedance to data equipment, ohms	RS-232-B	90-120
Voltages to and from data equipment	RS-232-B	5 or 23 ma
Frequency stability	±0.5%	—
Level stability	—	—
Output levels to line, dbm	−14 to +4	−6 to +6
Input levels from line, dbm	−30 min	−30 min
Line requirements, frequency response	4B voice	Built in equalizer for cable pair
Line requirements, envelope delay	4B voice	Built in equalizer for cable pair
Line requirements, impedance	4B voice	135
Line requirements, signal to steady noise	—	—
Line requirements, signal to impulse noise	—	—
Method of operation	4 wire	4 wire
Temperature and humidity limits	−20 to +50 deg C	0 to +50 deg C
Power requirements	115 volts AC, 10 watts	115 volts AC, 15 watts
Dimensions and weight	6" x 9" x 13¾", 14 lb	11" x 9" x 21", 35 lb
Digital or analog	Digital	Digital

PRODUCT NEWS

(Continued from page 31)

line signals from as many as 10 telephone lines and converts them instantly for transmission on a single line to the central computer. The data concentrators are located in strategically situated garages or other facilities of a transit company.

The information that is received is computer-checked instantly to determine whether it is valid. The information is stored on magnetic tape where it is available either for instant scrutiny or future analysis.

In addition, the information is timed and checked against a schedule filed in the computer. The computer then informs the bus dispatcher of any variations from schedule which fall outside of pre-determined tolerances. Tolerances can be altered at the will of the central office.

The wall map shows the location of each roadside receiving unit. Illuminated arrows at each location signal the direction of the passing bus. Each arrow is associated with three lamps of different colors. Each color indicates whether a bus is ahead, behind, or on schedule.

The TV display device will be available to the dispatcher whose area includes the largest number of roadside receivers. His display can monitor the full system, or during exceptional periods, he can transfer other information to the teletypes of the dispatchers covering other areas.

Teleprinters will provide a printed transcription of all information signaled by passing vehicles. *Sylvania Electric Products Inc. Circle 116 on Reader Service Coupon.*

● FLOAT CHARGERS are described in a new bulletin. Included are the principal design features of AutoReg chargers, how they operate, and tells how to determine correct charger size. It also contains a typical battery charger or power supply specification. AutoReg SRC float chargers are offered in a variety of 12-, 24-, 48-, 130- and 260-volt models with DC output from 1 to 400 amp. *C&D Batteries. Circle 117 on Reader Service Coupon.*

● DATA DISPLAY: The Uniscope 300 visual communication terminal is described in a bulletin U-4664 and shows how this keyboard operated input-output device can provide visual display on a cathode-ray tube of data stored in a computer or other information storage media. *Univac. Circle 118 on Reader Service Coupon.*

● SEMICONDUCTORS and integrated circuits numbering well over 8,000 are described in a new catalog supplement. Included are digital readout meters and measuring system accessories, miniature switches, module and delay timers, newly-designed relays, trimmers, potentiometers, capacitors and resistors, miniature lamp indicators, integrated circuit boards and kits, low-pass filters, high-voltage reed switches and other components. Supplement is No. 691. *Allied Electronics Corp. Circle 119 on Reader Service Coupon.*

Reader Service Coupon is opposite page 38.

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Circle 15 on reader service card on page 38

News Briefs

● DEPARTMENT OF TRANSPORTATION has asked the Federal Communications Commission to modify its requirement for vehicle locator systems employed in the land mobile radio services. DOT position was filed in conjunction with an FCC inquiry into the use of the radio frequency spectrum for the purpose of vehicle location.

"Knowledge of the locations of mobile units is of prime importance to the efficient operation of any system involving a large number of vehicles whether it be public transportation (buses or taxicabs), safety (police), transfer of goods (local or over the road trucks), or the general public (stranded motorists)" DOT said.

DOT's Urban Mass Transportation Administration has funded $1.5 million to the Chicago Transit Authority to partially finance a bus locator system project that includes a two-way radio and a means for notifying a dispatcher in an emergency.

DOT said that the "automatic vehicle monitoring systems will serve a useful social and economic purpose, allowing a more efficient overall use of the radio spectrum."

● PENN CENTRAL will spend $1,741,600 to modernize its Morrisville, Pa. freight yard. This flat switching facility will be converted to an automatic yard. An average of 900 cars per day are now being routed through this yard. It is anticipated that improvement in car movement ranging up to 25% can be obtained from the new facilities. Improvements include the installation of retarders, automatic switching equipment and centralized traffic control to provide for operation in both directions on a present westbound track, and electrification of five receiving yard tracks.

PC has installed a high-load detector at Glen Osborne, near Sewickley, in the Pittsburgh area. The detector is set for 17 ft 9½ in. above top of rail. If the light beam is broken by load on a car, or an extra high car, a tape recorder is actuated and a count of cars from the high one is made to the end of the train. This information alerts an interlocking operator to control signals to stop the train at Island Avenue Yard, on the north side of Pittsburgh.

● SOUTHERN PACIFIC has installed jet spray equipment at two automatic hotbox detector installations on its Palmdale-Colton cutoff in California. Two other installations have been made on lines in Texas. When a hotbox detector has been actuated by an overheated journal, a beacon light atop an adjacent wayside equipment housing will be lighted and begin rotating. Also, two sets of three lights each, positioned one above the other, are located atop the housing and, on either side of the rotating beacon. A light will flash when the hotbox detector has been actuated and the position of the light will indicate which side of the train the hotbox is located. Also, actuation of the detector will cause trackside jets to spray a white fluorescent dye on the wheel with the overheated bearing.

● SECTIONAL MEETINGS of the Communication & Signal Section AAR will be held at Alexandria, Va. and Omaha, Neb. On Tuesday, April 15, the western sectional meeting will be held at the Prom Town House Motor Inn, Omaha, Neb. Chairman of this meeting is C. O. Jett, superintendent communications, Union Pacific. Committee of Direction sponsor is V.S. Mitchell, signal engineer, Chicago & North Western. The eastern sectional meeting will be held at the Twin Bridges Marriot Motor Hotel in Alexandria, Va. on May 14. Chairman is J. M. Hesser, assistant manager signals and communications, Norfolk & Western, and committee of direction sponsor is R. D. Liggett, chief engineer, communications and signals, Seaboard Coast Line.

● SPECTRUM MANAGEMENT was discussed by R. P. Gifford, general manager, communications products department, General Electric, at last month's annual meeting of the Institute of Electrical and Electronic Engineers in New York. Mr. Gifford, as chairman of the joint technical advisory committee, discussed the national goal of maximizing the effective use of the radio spectrum so that present uses can be adequately accomodated, and the needs for future growth and for new uses met.

First, the system must be evolutionary. The present system's functioning is understood, in varying degrees, by many thousands of people—millions, if licensees' operators and Amateur and Citizens Radio Services licensees are included. Changes in the system must be well thought out and amply foretold, or the continued co-operation of those concerned will simply not be possible. Also, recovery of capital investment in equipment must be considered in planning for changes. But none of this means that evolution must continue at the snails pace of the past.

Second, spectrum engineering and management thinking must continue to move away from the concept of controlling spectrum usage through simple but rather restrictive and rigid administrative rules. The movement must be in the direction of increasingly individual technical assessment of applications in different geographic areas under explicitly formulated priority criteria, and under a reduced and more flexible employment of block allocation concepts. This will require much heavier use of analytical and data-processing capabilities in the nation's spectrum engineering than at present.

James C. Taylor
Illinois Central

R. M. Laurenson
Frisco

Railroad Personnel

● ALASKA: The following men are officers and supervisors in the communications branch: **Andrew J. Clark, Jr.**, chief communications officer, **Glenn R. Miller**, maintenance supervisor, **Danny D. Lommel**, assistant maintenance supervisor, **Norman F. Farmer**, communications installer and repairer foreman, **Jesse F. Charbula**, telephone lineman foreman.

● CHESAPEAKE & OHIO/BALTIMORE & OHIO: **J. B. Dowdy** appointed system signal inspector at Huntington, W.Va. **V. L. Itnyre** appointed communications application engineer, also at Huntington. **R. B. Lang** appointed supervisor communications services at Baltimore, Md. **J. H. Payne** appointed supervisor communications services at Huntington.

● CHICAGO SOUTH SHORE & SOUTH BEND: **Charles F. Mulrenan**, assistant chief engineer, appointed chief engineer succeeding **Loren F. Pohl**, appointed assistant to the president.

● DENVER & RIO GRANDE WESTERN: **E. M. Curtis** appointed assistant signal supervisor at Helper, Utah. **E. E. Stephens** appointed assistant signal supervisor at Denver, Colo.

● ILLINOIS CENTRAL: **James C. Taylor**, engineer of communications, promoted to director of communications, succeeding **George Pipas**, who was promoted to director communications and computer services (RS&C Feb. 1969, page 33). Mr. Taylor was born in Canton, N.Y. on Jan. 19, 1930. After graduation from the New York State Agricultural & Technical Institute in 1950, he joined New York Telephone Co. doing transmission work. Subsequently, he was employed by General Electric Co. as field engineer and then project supervisor on Southern's microwave system. He joined IC in 1967 as engineer of communications.

● RICHMOND, FREDERICKSBURG & POTOMAC: **Charles W. Butcher** appointed supervisor signals and communications at Potomac yard, Alexandria, Va. A native of Harpster, Ohio, Mr. Butcher joined the C&O as a signal helper in 1947. By 1964 he had become signal supervisor for the Toledo Terminal and two years later he joined Union Switch & Signal Construction Co. as a field installation foreman. He held this position of the time of his present appointment.

Richard T. Taylor, Jr., communications inspector, has been promoted to chief communications inspector.

● ROCK ISLAND: **V. W. Lash** appointed assistant to signal engineer.

(Please turn to page 38)

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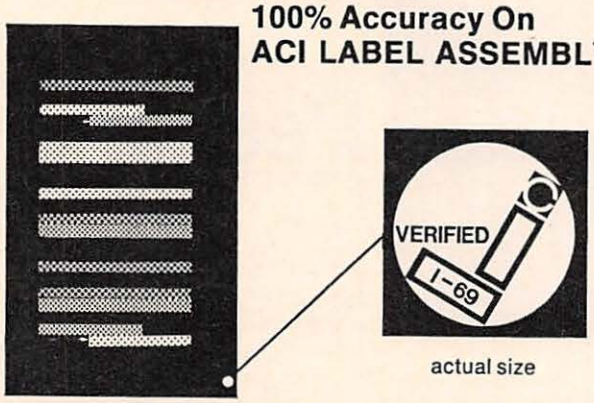

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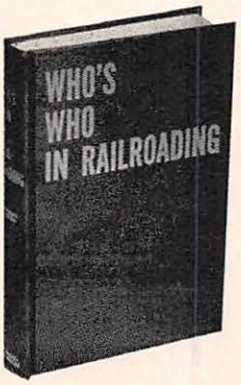

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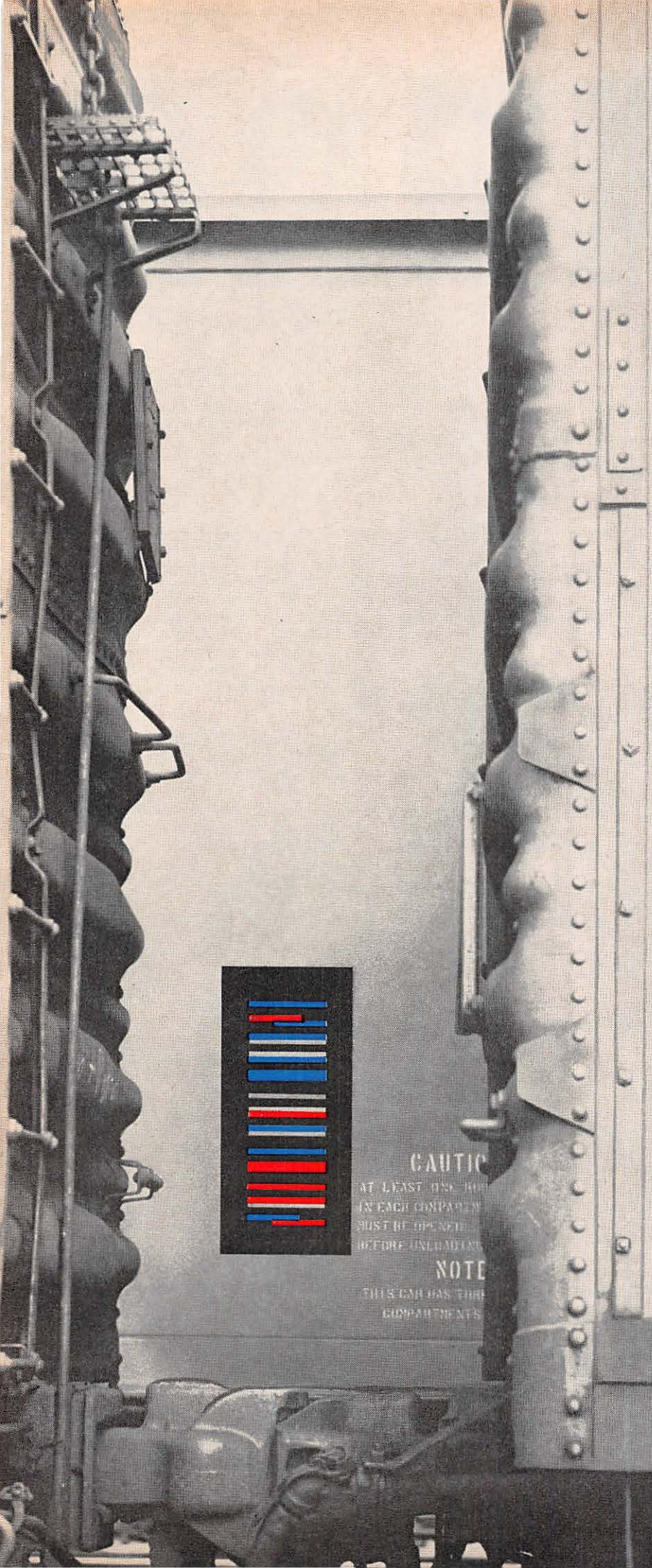

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NEWS BRIEFS

(Continued from page 34)

● ST. LOUIS-SAN FRANCISCO: **C. C. Evans,** chief draftsman, appointed office engineer succeeding **C. H. Johnson,** retired. **V. L. Klein,** senior draftsman, appointed chief draftsman. **Robert M. Laurenson,** superintendent of communications, retired April 1.

Mr. Laurenson was born Oct. 18, 1906 at Tiskilwa, Ill. He received a bachelor of science degree in electrical engineering from the University of Michigan in 1930. Upon graduation he joined Union Switch & Signal Co. in the engineering department. In 1949, he was appointed communications engineer—Frisco, and in 1956, appointed superintendent of communications. Last year Mr. Laurenson was chairman of the Communication & Signal Section, AAR.

Supply Trade News

● ABEX CORP.: **David D. Webster** appointed sales representative St. Paul, Minn. for the railroad products group.

● COMPUTER IDENTICS CORP.: **Richard C. Burke,** formerly with Commercial Electronics division, Sylvania Electric Products, Inc., appointed manager of the control materials division. Mr. Burke was in charge of labeling when with Sylvania. At CI he will be responsible for a digital computer based optical inspection system which reads each ACI label after assembly. Any label assembly errors detected are corrected immediately and an accurate reading is obtained before the label is shipped.

● THOMAS A. EDISON INDUSTRIES, Primary Battery Div.: **Richard E. Lodholz** appointed service engineer with headquarters at St. Louis, Mo. Mr. Lodholz was born on May 16, 1926. He began his railway career with the Reading in 1944 and in 1947 was appointed a signal helper. He advanced through various positions in the signal department becoming general signal foreman, the position he held at the time of his present appointment.

● GENERAL RAILWAY SIGNAL CO.: **Gerald E. Collins,** manager instrument transformer business section, General Electric, has been elected president. Mr. Collins was born on Jan. 11, 1924, at South Lee, Mass. He graduated from Norwich University in 1947 with a bachelor of science degree in chemistry. He joined the chemical division of General Electric upon graduation. He held various positions as a purchasing and production control specialist and was appointed manager of materials of the capacitor department in 1959. In 1963, he was promoted to manager of manufacturing operations. From December of 1963 until March 1968, Mr. Collins was manager of manufacturing of outdoor lighting for GE and, in March 1968, promoted to manager of instrument transformer business section, the position he held prior to his election as president of GRS in August 1968.

Richard E. Lodholz
T. A. Edison

Gerald E. Collins
Gen Ry Signal

Joseph D. Aldern
Railroad Accessories

P. E. Dunn
S&C Div. Wabco

Carl L. Henricks
Western-Cullen

Reuel L. Broomfield
Santa Fe

● GOULD-NATIONAL BATTERIES, INC.: **John F. Smith,** former vice-president marketing, Haveg Industries, Inc., has been appointed manager of marketing, industrial battery division.

● KERITE CO. may be acquired by Harvey Hubbell Inc., a Bridgeport, Conn. electrical and electronics manufacturer. Terms of the acquisition have been approved by the boards of directors of both companies. Kerite would become a subsidiary and its chairman, T. O. Rudd, and president, F. S. Harris, would continue in their present positions. However, the post of chief executive officer would be transferred to Mr. Harris from Mr. Rudd.

● KOPP GLASS INC.: **James L. Newton,** vice president, has been elected president.

● RAILROAD ACCESSORIES CORP.: **Joseph D. Aldern,** former assistant signal engineer, Milwaukee Road, appointed sales and service representative with headquarters in the Philadelphia, Pa. area. Mr. Aldern was born on Oct. 5, 1926 in Madison, S.D. He joined MILW in 1944 as a signal helper. In 1948 he was promoted to signal maintainer, and in 1956 was appointed signal circuit draftsman. Two years later, he was appointed signal inspector. In 1964, Mr. Aldern was appointed assistant engineer of signals, and a year later promoted to assistant signal engineer.

● RFL INDUSTRIES INC.: **Andrew J. Begoss** appointed electronic design engineer for the communications division.

● SANGAMO ELECTRIC CO. appointed Data Processing Supplies, Inc., to represent them in the sale of the Sangamo data station (a computer input/output terminal) in the states of Ohio, Kentucky, West Virginia, Indiana, western Pennsylvania and southern Illinois.

● SERVO CORP. OF AMERICA: **Clyde Schelp** appointed field service manager.

● SIGNAL & COMMUNICATIONS DIV. OF WABCO: **P. E. Dunn** appointed marketing engineer—railway and industrial sales. Formerly associated with Hughes Aircraft, Mr. Dunn joined WABCO in 1964. He is an engineering graduate of the University of Southern California and has a master of business administration degree from the University of Pittsburgh. He will be responsible for marketing ACI equipment.

● SYLVANIA ELECTRIC PRODUCTS INC.: **Robert L. Smith,** former sales representative IBM, data processing and transportation control systems, has been appointed marketing manager, transportation control systems for the Commercial Electronics Div.

● WESTERN CULLEN DIVISION OF FEDERAL SIGN & SIGNAL CORP.: **Carl L. Henricks,** former project manager, railroad division of Watson-Flagg Engineering Co., appointed manager signal sales. Mr. Henricks, 40, a native of Pittsburgh, Pa., began his signal career as a signalman on the Hudson & Manhattan (now PATH) in 1950. Two years later, he was appointed sales engineer with Kerite Co. In 1954, until his present appointment, he was employed by Watson-Flagg in signal work. From 1954 to 1964, he was signal engineer at which time he was promoted to project manager of the railroad division.

Obituary

● REUEL L. BROOMFIELD traffic control engineer-system, AT&SF, died of a heart attack on Jan. 16. Mr. Broomfield was born April 17, 1904, at Ottawa, Kan. He joined AT&SF signal department in 1924 as a signal helper. He advanced through various positions such as signal maintainer, draftsman in the signal engineer's office and was chief draftsman in 1929. Subsequently, he was promoted to signal construction foreman and, in 1943, was promoted to CTC engineer. In 1959, he was promoted to CTC engineer system. His title, subsequently, was changed to traffic control engineer-system.

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